User's
Manual

USER'S MANUAL

IM01C62R01-01E
Second edition

FOREWORD

Thank you for purchasing our paperless recorder!

This manual is about the functions, settings, wiring methods, methods of operation, failure of treatment methods of the paperless recorder. To ensure correct use, please read this manual carefully and use properly before operation and keep this manual in a safe place for quick reference.

Notice

The contents of this manual are subject to change without prior notice as a result of continuing upgrades to the instrument's performance and functions.

Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, if you have any questions or find any errors, please feel free to contact us.

Copying or reproducing all or any part of the contents of this manual without our permission is strictly prohibited.

Revisions

June, 2010, Second edition

SAFETY PRECAUTIONS

For your safe use of this instrument be sure to comply with the following safety precautions. If the instrument is used in a manner not specified in this manual, the protection provided by the instrument may be impaired. We assume no responsibility for the customer's failure to comply with these requirements.

WARNING

●Power Supply

Before connecting the power cord, ensure that the power supply voltage matches the voltage rating for the instrument.

●Protective Grounding

Make sure to connect the protective grounding to prevent electric shock before turning on the power.

●Necessity of Protective Grounding

Never cut off the internal or external protective grounding wire or disconnect the wiring of the protective grounding terminal. Otherwise, it will pose a potential shock hazard.

●Defect-Free Protection

Do not operate the instrument when the protective grounding might be defective. Also, make sure to check them before operation.

●Do Not Operate in Explosive Atmosphere

Do not operate the instrument in the presence of flammable, explosive gas or vapors. In such circumstances the use of this instrument is very dangerous.

●Do Not Remove Covers

Please do not tear down part of the front screws and open the front panel, because some areas inside the instrument have high voltages .The cover should be removed by our qualified personnel only.

●External Connection

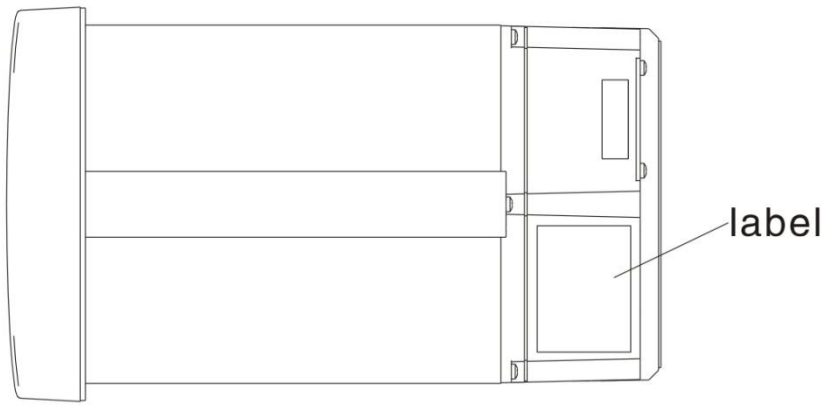
Connect the protective grounding before connecting to the items under measurement or external control circuit connections.

●Damage to the protection

Using the instrument in a manner not specified in this manual can damage the instrument's protection.

CHECKING CONTENTS OF THE PACKAGE

Unpack the wrapping box and check the contents before operating the instrument. If some of the contents are not correct or missing or if there is any physical damage, contact our company or the sales network from which you purchased it.



Accessories

The following accessories are supplied with the instrument. Make sure that all items are present and undamaged.

Number	Name	Quantity	Notes
1	Mounting bracket	2	For panel mounting
2	User's Manual	1	This manual
3	Certification	1	Manufacture Date
4	Standard Software	1	CD-ROM (Included only when the communication / U disk/ SD card storage is ordered. For Windows 2000/XP/Windows Vista/Windows 7.
5	Communication Cord	1	2m(Included only when the Communication is ordered.)
6	U Disk	1	Included only when the external storage is ordered. Capacity and model of the USB storage may vary.
7	SD card	1	Included only when the SD card storage is ordered. Capacity and model of the storage may vary.

Accessories (Sold Separately)

The following optional accessories are available for purchase separately. When ordering, make sure whether there is a shortage or damage. For information about ordering accessories, please contact us.

Number	Name	Quantity	Notes
1	U Disk	1	1GB 2GB 4GB
2	SD Card	1	1GB 2GB

HOW TO USE THIS MANUAL

This user's manual consists of the following chapters:

Chapter	Title and Contents
1	Overview of Functions Describe the functions of the instrument
2	Before Using the Instrument Describe the installation and wiring connection
3	Names of All Parts/ Mode of Usage/Common Operations Describe the names of each part of the instrument, how to use the storage medium drive, run mode, and common key operations.
4	Switching Operation Screens Describe how to use the operation screen such as the trend display and digital display. Describes the operations that can be performed using the arrow keys, page key and the enter key on the front panel.
5	System Configuration and Its Function Describe the related parameters of running system and its functions
6	Record Configuration Set the related parameters of the recording data
7	Input Configuration Set the relevant parameters measured input channels
8	Output configuration Set the relevant parameters of output transmitted channel
9	Alarm Configuration Set relevant parameters of alarms and relays.
10	Display configuration Set related parameters of channel combinations and display
11	Report Configuration Set related parameters of channel accumulation and report
12	Print Configuration Set related parameters of print function
13	Communication Configuration Set parameters related to communications
14	Check System Information Check system information, and AD board running
15	Specifications List the specifications of the Paperless Recorder

Symbols Used in this Manual

Unit

K Denotes”1024”
k Denotes”1000”
M Denotes“1024K”
G Denotes“1024M”
B “Bytes”

Symbols (The following symbols are used in this manual)

WARNING: Precautions that should be observed to prevent injury or death to the user.

CAUTION: Precautions that should be observed to prevent damage to the instrument.

Note: Providing important information for the proper operation of the instrument.

Operation of Marks

The following symbols are used during the explanation of operation

[ ] : Represents key’s name. Example: [Page] [En]
『』: Represents a reference item. Example: 『Input Channel』
【】: Indicates screen element .Example: 【Device Name】

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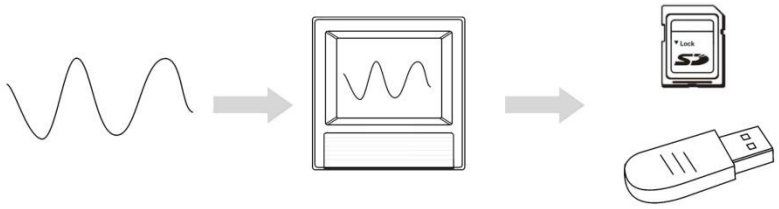
CHAPTER 1 OVERVIEW OF THE FUNCTIONS

1.1 OVERVIEW OF THE INSTRUMENT

Unlike conventional record that record data on charts, the Instrument displays the measured data in a LCD. Moreover, the measured data can also be saved to external storage media such as U Disk (additional specifications).
Measured/ operational data can be used as displayed data stored in the memory, or you can also insert the external storage to save it in the external storage media through automatic or manual backup.



Displayed data is shown as curves and other data on meter screen. It is the data filter out from the samples by the instrument. A datum is equivalent to a point on the curve of the screen. The time of a datum is determined by recorded meter intervals. Historical data is equivalent to the original recording paper, which is very suitable for long-time observation.

1.2 FUNCTIONS OF THE INPUT SECTION

Number of Measurement Channels/Scan Interval

The number of measurement channels can be selected from 1~16.
The scan interval of measurement is 1 second.

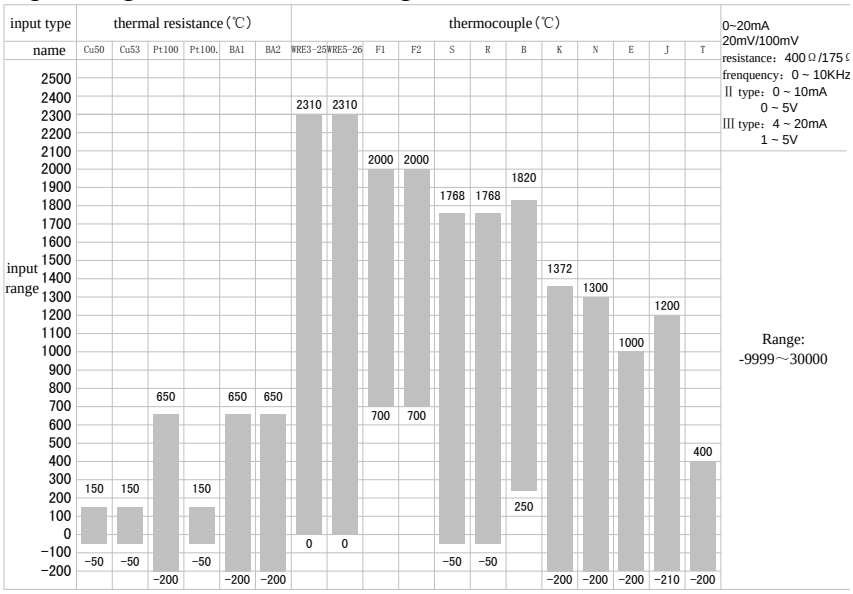
Input Type and Computation

You can select the input type of a measurement channel as follows. You can also perform computation for instance, the "square root," on the measured data. For the procedure related to setting the different modes, see section『System Configurations』

Input Mode	Signal Type
DC current	0-20mA，4-20mA，0-10mA
DC voltage	0-5V，1-5V，0-10V，20mV，100mV
Resistance	400∏,175∏
frequency	Fr
RTC	PT100，PT100.，Cu50，Cu53，BA1，BA2
Thermocouple	S，R，B，K，N，E，J，T，WRE5-26，WRE3-25，F1，F2
General vacuum	20mA，5V，10V
Section vacuum	20mA，5V，10V

Input Range and Measurable Range

You can select the "Input range" that is appropriate for the input signal in "DC current," "DC voltage," "Resistance," "Thermocouple" "Thermal Resistance," "Frequency signal".
For each "Input range," a measurable range is defined.



Burnout

When measuring temperature with a thermocouple / thermal resistence /4-20mA/1-5V signal, the instrument provides check burnout function. You can specify the measurement result to be set to maximum of measurable range, minimum of measurable range, last value or Error Flag*1. For the setting procedure, see section 『Burnout』

*1 when the burnout setting is Error Flag, the measured value is indicated as "-.--".

Reference Junction Compensation (RJC)

When measuring the temperature using a thermocouple, the reference junction compensation can be used. Reference junction compensation current is installed. You can adjust the temperature that measured by the instrument. For the setting procedure, see section "reference junction compensation".

Filter

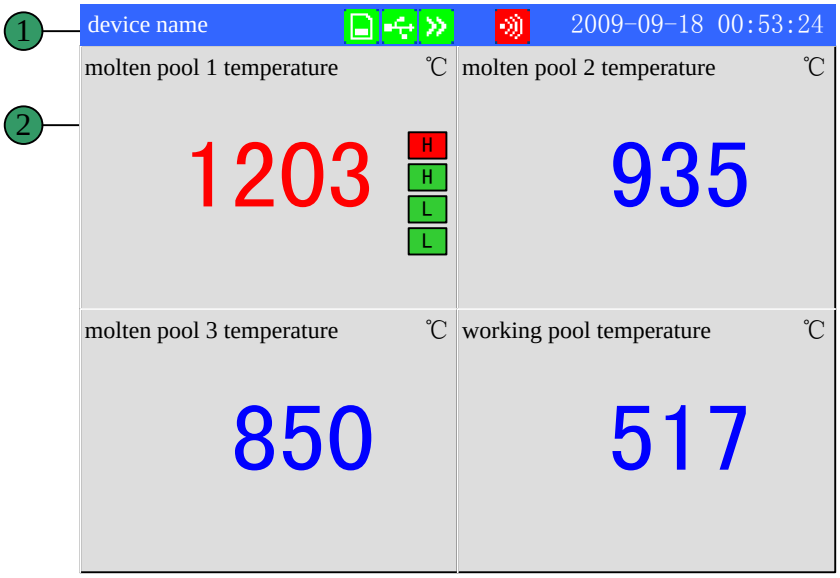
The filter is used to suppress the disturbance that is curbing the signal. Filtering is provided by the standard products. The filter can be set on each channel. For the setting procedure, see section 『set filter parameter』.

1.3 DISPLAY FUNCTION

Common items related to the display

TFT Color LCD and the Screen Configuration

The instrument has a 5.6” TFT color LCD (320-by-240 dot resolution). The screen consists of the status display section and the data display section.



1. Status Display Section

Display the screen name, date and time, input acquisition board status, relay output status, USB devices connection (additional specifications), cycle display signs, searching status. For details, see section 『status display』.

2. Data Display Section

Display the operation screen such as the digital display, bar graph display and trend display alarm, print, backup, etc.

When it has function configuration, display configuration mode.

Group Display

The data displayed on the curve displays are the data of measurement or computation channels that are assigned to the group. Up to 6 channels can be assigned to a single group. For the procedure used to assign channels to groups, see section『configuration display 』.

Up to 6 sets of combinations can be used in the digital screen, bar graph screen, real-time curve screen and historical curve screen effectively.

Run Mode

This mode is entered when the power is turned on.
Display various operation screens such as signal's digital, alarm status, trend, historical trend, alarm summary, data print (option), and data backup display (option).

Running condition is under a number of remarkable figure images, digital display screen, bar graph screen, real-time curve of the screen, and historical curve of the screen and data query. Data query, including the alarm list screen, data print screen (additional specifications), backup historical data (additional specifications), the accumulative report (additional specifications), power-down recording and system logs and other screens.

Configuration screen

This instrument is in Configuration mode to set various functions.
Under Configuration mode, this screen is used to set system configuration, recording configuration, input configuration, output configuration, alarm configuration, display configuration, report configuration, print the configuration and communication configuration parameters.

1.4 STORAGE FUNCTION.

The instrument can save measured data and computed data, which are first acquired to the instrument's internal memory as display data. Then, the data are saved to the external storage medium on paper. For detail, see sections『data backup 』and 『recording configuration』.

External Storage Media

U disk, 1GB - 4GB (optional);
Normal SD card, 1GB - 2GB(optional), non SDHC card.

Measurement period and recording intervals

AD sampling period is 120 milliseconds, which is an integer multiple of 50Hz power period. This can effectively eliminate the interference of power frequency. The measurement interval of signal is fixed at 1s. The measuring and computing are completed in every scan interval. Display data is generated by these data.
Recording Interval is used by the instrument to record the time interval of data which is saved to the internal memory.

Saving Data to Internal Memory

The display data are saved to internal memory continuously according to the recording interval.
If the instrument is unplugged, the data that is lost while unplugged will be complemented by '0' when the power is turned ON.

Saving Data to External Storage Media

Automatic Backup: after inserting The SD card into the drive, the instrument automatically back up the historical data to SD card every day from time to time.
Manual Backup: enter the screen "data backup", and then you can back up internal data to USB or SD cards.

1.5 ALARM FUNCTION

Real-time data alarm can be set or alarm relay output (additional specifications). For details, see section 『Setting Alarms』.

Number of Alarms
You can set up to four alarms for each channel.
High alarm (H)
An alarm occurs when the measured value is greater than or equal to the alarm value.
Low alarm (L)
An alarm occurs when the Measured value is less than or equal to the alarm value.
Incremental alarm (I)
An alarm occurs when increased measured value of the time point is greater than or equal to the value of alarm value.
Reduction alarm (D)
An alarm occurs when reduced measured value of the time point is greater than or equal to alarm value.

Alarm Accessibility
Use the following auxiliary functions

Functional	Content
Transfinite alarm Hysteresis	Set any hysteresis within the range
Incremental Alarm Time	Setting the length of incremental alarm time
Reduced alarm time	Setting the length of reduced alarm time
Alarm relay output (additional specifications)	When alarm occurs, output contacts signal

Alarm display
Show alarm state in the digital display screen, bar screen and real-time curves of screen, and display the icon of output relay in the System Column.

1.6 REPORT FUNCTIONS (ADDITONAL SPECIFICATIONS)

The Accumulation computation and reports can be performed.

Accumulation Computation

The accumulation computation is performed every second.
The accumulation computation can be performed on each measurement channel.
For detail, see section『Report Setting』

Report function

Based on total accumulated data to show generated shift reports, hourly reports, daily and monthly reports and to keep the data up to 450 days.
Class report: According to the number of class and time settings to show the cumulative amount of each shift.
Horly report: Show the cumulative amount generated per hour.
Daily report: Shows the cumulative amount generated every day.
Monthly report: Shows the cumulative amount generated per month.

1.7 OUTPUT FUNCTIONS (ADDITIONAL SPECIFICATIONS)

Measured and Computed data can be transmitted and output as an analog signal.

Transmitter Output

The signal type of transmitter output is 4-20mA.
The instrument provides 4 channels transmitter output.
The maximum load of each channel is 750Ω.
For detail, see section 『 Output Configuration Setting』

1.8 COMMUNICATION FUNCTIONS (ADDITIONAL FUNCTIONS)

The instrument can communicated with PC via serial cable（RS232C/RS485）And also can print data by micro printer.

RS232C/RS485 Communications

RS232C or RS485 can be select when the instrument communicates with PC.
By using the wired network (485 networks), radio, GPRS, Modem and other methods, connect to the computer.
The Instrument adopts the international common standards: MODBUS-RTU communication protocol.
The OPC software also provides for users, you can use it to connect the he configuration software.

Connect to the panel printer

The instrument can be connected to the panel printer.
You can print history data and history curve manually.
Print real-time data can be automatic or manual.

1.9 OTHER FUNCTIONS

24 VDC Power Supply for Transmitter (Option)

The instrument provides 4 channels power supply of 24 VDC. The maximum current of each channel can be provided is 60mA.
This instrument supports 2-wire 4-20mA current input. For the wiring method, please refer to 『24VDC Power Supply for Transmitter』

CHAPTER 2 BEFORE USING THE INSTRUMENT

2.1 PRECAUTIONS ON THE USE OF THE INSTRUMENT

Read the following precautions before using the instrument and the external storage medium (U disk).

Handling Precautions

● be careful when cleaning the instrument, especially any plastic parts. When cleaning, wipe with a dry, soft cloth. Do not use chemicals such as benzene or thinner, since these may cause discoloring and deformation.
●Keep electrically charged objects away from the instrument as this may cause malfunction.
●Do not apply shock to the instrument.
●If there are any symptoms of trouble such as strange odors or smoke coming from the instrument immediately turn OFF the power and unplug the power cord. Then, contact your dealer or our company.

Handling precautions of external storage media

●handling external storage media carefully as they are delicate products.
●Please note the U disk ESD protection.
●Recommend using this company's products
●If you are using them in a high-temperature environment (greater than 40℃), we recommend the external storage medium be inserted into the drive when saving the data and be removed after the data have been saved.
● Remove the external storage medium from the drive when turning ON/OFF the instrument.
●When the store lights (in the U disk) light up, do not remove the storage media, otherwise it may destroy the data.
●For general precautions please see the instruction manual that came with the external storage medium.

2.2 INSTALLING THE INSTRUMENT

To the installing place of this instrument, the installation method will explain here. Be sure to read this section before install it.

Installation location

Install the instrument in a location that meets the following conditions.

● Instrument panel

The instrument is designed for panel mounting.

●Location of installation

To prevent rain and direct heat, install the instrument indoors.

● Well-ventilated location

To prevent overheating, install the instrument in a well-ventilated location.

●Minimum mechanical vibrations

Choose an installation location with the minimum mechanical vibration.

●Horizontal

Install the instrument horizontally (However, the instrument can be inclined up to 30 degrees backwards for panel mounting).

Note
●Condensation may occur if the instrument is moved to another place where both the ambient temperature and humidity are higher, or if the temperature changes rapidly. In addition, measurement errors will result when using thermocouples. In this case, let the instrument adjust to the new environment for at least one hour before using the instrument. ●The lifetime of the LCD may be shortened (lower picture quality, etc.) if the instrument is used in a high-temperature environment over a long period of time. When installing the instrument in a high-temperature environment (greater than 40 ℃), please don not do it.

Do not install the instrument in the following places:

1. In direct sunlight or near heat sources

Install the instrument in a place with small temperature fluctuations near room temperature (23.C). Placing the instrument in direct sunlight or near heat sources can cause adverse effects on the internal circuitry.

2. Where an excessive amount of soot, steam, moisture, dust, or corrosive gases are present

Soot, steam, moisture, dust, and corrosive gases will adversely affect the instrument. Avoid such locations.

3. Near strong magnetic field sources

Do not bring magnets or instruments that produce electromagnetic fields close to the instrument. Operating the instrument in strong magnetic fields can cause errors in the measurements.

4. Bad angle for viewing the screen

Because the instrument uses a 5.6” TFT color LCD, it is difficult to view the display from an extreme angle. Please install the instrument so that the monitor can be viewed from the front.

Installation Procedure

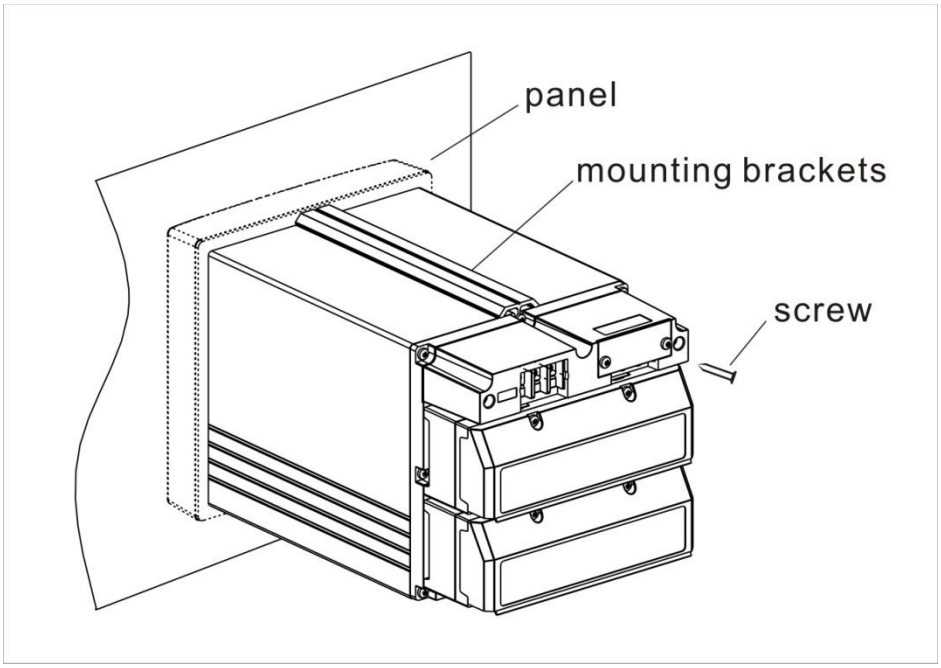
The instrument should be mounted on a steel panel of thickness 1 mm to 10 mm.

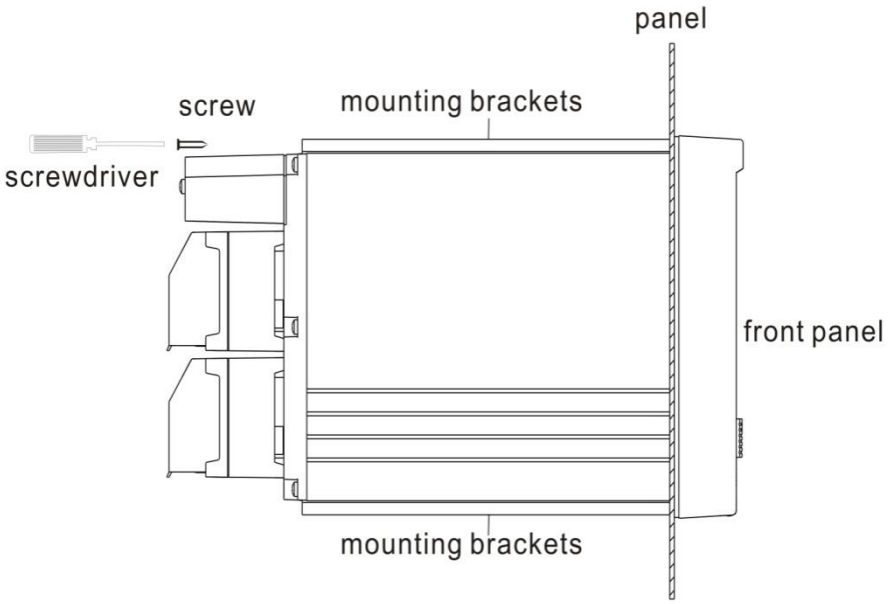
1. Insert the instrument from the front side of the panel.
2. As shown in the figure below, mount the instrument to the panel using the mounting brackets that came with the package.

●Use two brackets under the cover of the instrument

●The screws of instrument panel mounting bracket are the standard M4 screws.

Installation diagram





2.3 INPUT AND OUTPUT SIGNAL WIRING

Here will explain the measurement of input / output signal lines. Be sure to read this section before connecting the input and output signal wiring.

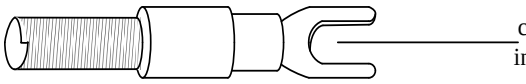
Caution

If a strong tension is applied to the cable wired to the instrument, the terminals of the instrument and the cable can be damaged. In order to prevent tension from being applied directly on the terminals, fasten all wiring cables to the rear of the mounting panel.

Precautions to be taken while wiring

Take the following precautions when wring the input signal cables.

It is recommended that crimp-on lugs (designed for 4 mm screws) with insulation sleeves be used on the lead wire ends.



crimp-on lugs (designed for 4 mm screws) with insulation sleeves be used on the lead wire ends.

Take measures to prevent noise from entering the measurement circuit.

● Move the measurement circuit away from the power cable (power circuit) and ground cable.

●It is desirable that the item being measured does not generate noise. However, if this is unavoidable, isolate the measurement circuit from the item. Also, ground the item being measured.

●Shielded wires should be used to minimize noise caused by electrostatic induction. Connect the shield to the ground terminal of the instrument according to the need (make sure you are not grounding at two points).

●For the interference generated by electromagnetic induction, if splicing the equidistant dense circuit wiring, it will be more effective.

●The resistance of ground terminal is lower.

When using the thermocouple input, take measures to stabilize the temperature at the input terminal.

●Always use the input terminal cover.

●Do not use thick wires which may cause large heat dissipation (cross sectional area 0.5mm^2 or less recommended).

● Make sure that the ambient temperature remains reasonably stable. Large temperature fluctuations can occur if a nearby fan turns ON or OFF.

Connecting the input wires in parallel with other devices can cause signal degradation, affecting all connected devices.
If you need to make a parallel connection, then
● Ground the instruments to the same point.
●Do not turn ON or OFF another instrument during operation. This can have adverse effects on the other instruments.
●RTD cannot be wired in parallel.
● Current signal cannot be wired in parallel.

WARNING
To prevent electric shock, ensure the main power supply is turned OFF

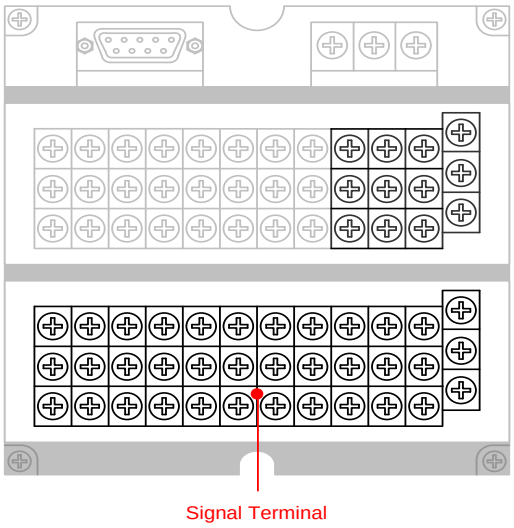
CAUTION
Do not apply input signals that exceed the following values. This can damage the instrument。
Maximum input voltage
Voltage range of 0.2 VDC or less or thermocouples: -1V ～ +5V
Voltage range between 2 and 10 VDC: -1V ～ +12V
Current： -4mA ～ +25mA
2.Maximum common mode noise voltage
250VACrms（50Hz）

Wiring Procedure

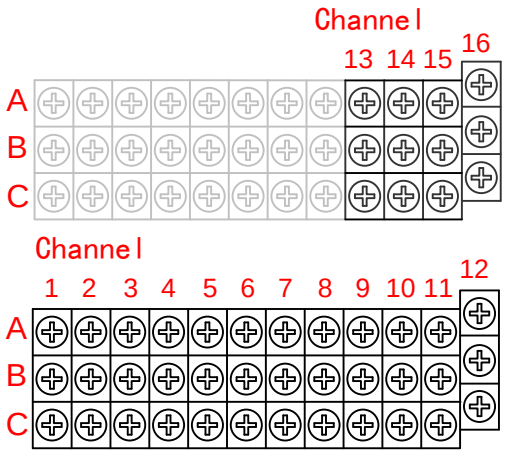
1. Turn OFF the instrument and remove the input terminal cover.
2. Connect the input/output signal wires to the input/output terminals.
3. Fit with the rear terminal cover and supply electricity.

Note
Remove the rear terminal cover in order to easily carry out wiring work. To prevent bad connection, after wiring please carefully tighten the screws.

The position of input / output signal terminal in the tail terminal

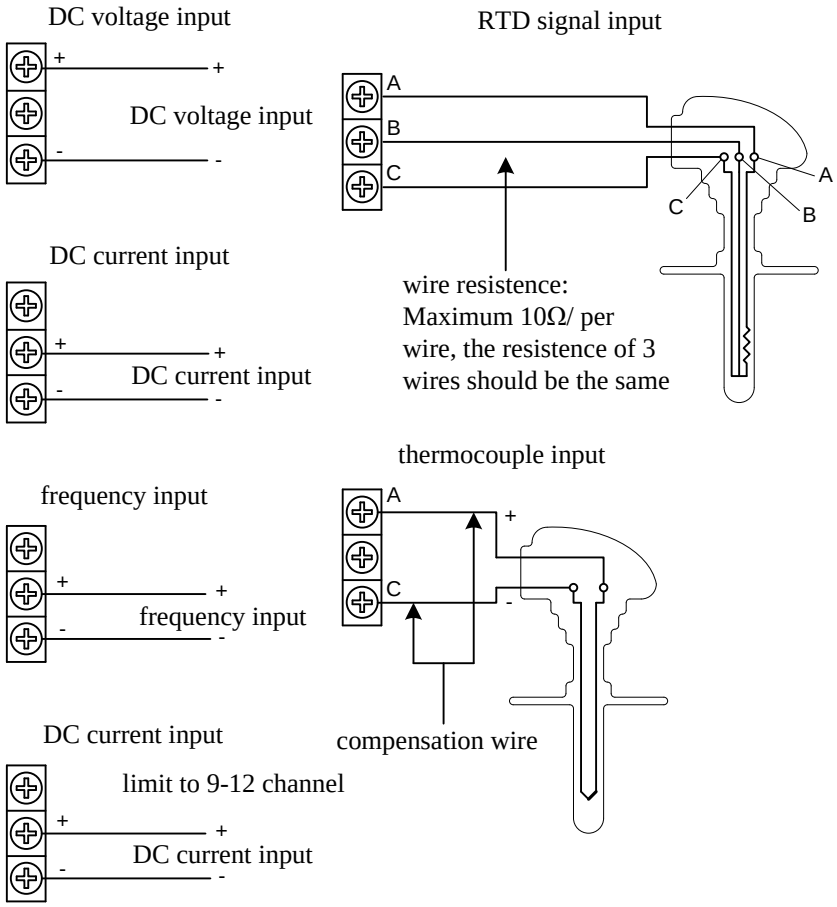


Input / output signal channel arrangement



Note:
If the channel number is less than 12, the signal terminal from 13 to 16 channels will be used in relay output and input digital signal.

Wiring diagram



2.4 ALARM OUTPUT WIRING (OPTION)

WARNING

● To prevent electric shock, ensure the main power supply is turned OFF.

● If a voltage of more than 30 VAC or 60 VDC is to be applied to the alarm output terminal, use ring-tongue crimp-on lugs with insulation sleeves on all terminals to prevent the wires from slipping out when the screws become loose. Furthermore, use double-insulated wires (dielectric strength of 2300 VAC or more) for the signal wires on which a voltage of more than 30 VAC or 60 VDC is to be applied. For all other wires, use basic insulated wires (dielectric strength of 1350 VAC). To prevent electric shock, attach the terminal cover after wiring and make sure not to touch the terminals.

Wiring Procedure

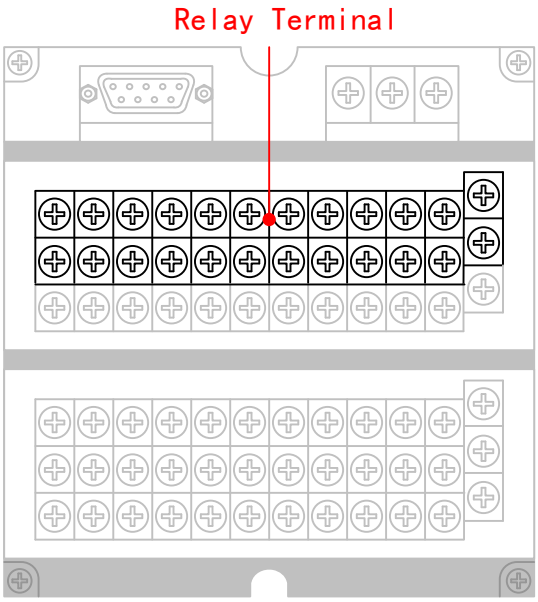
1. Turn OFF the instrument and remove the cover for the rear terminal.
2. Connect the alarm output cables to the terminal.
3. Replace the terminal cover and fasten it with screws.

CAUTION

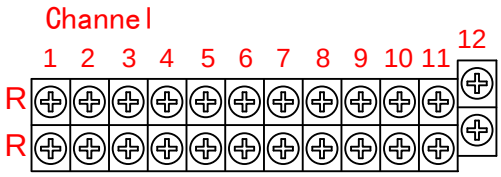
Remove the rear terminal cover to wire easily. In order to prevent poor contact, tighten the screws after wiring

.

Alarm Output Terminal Position



Alarm relay contact arrangement



Note:
If the channel number is more than 12, then the largest contact number is 8, and contact terminal from 9 to 12 is used as signal input terminal in channel 13 to 16.

Relay Specifications

Item	Content
Output	Relay transfer contact (switchable)
Output capacity	250VAC/3A 30VDC/3A
Dielectric	500VAC/one minute

2.5 CONNECT POWER SUPPLY

Here explains power wiring method. Be sure to read this part before connecting power.

Precautions to be taken when wiring the power supply

To prevent electric shock and damage to the instrument, observe the following warnings.

WARNING

●To prevent electric shock, ensure the main power supply is turned OFF.

●To prevent fire, use doubled-insulated wire

Make sure to earth ground the protective earth terminal through a grounding resistance less than 100Ω before turning ON the power.

●Use crimp-on lugs (designed for 4mm screws) for power and ground wiring termination.

●Make sure to provide a power switch (double-pole type) on the power supply line in order to separate the instrument from the main power supply. Put an indication on this switch as the breaker on the power supply line for the instrument.

Switch Specification Rated current: 3A or more

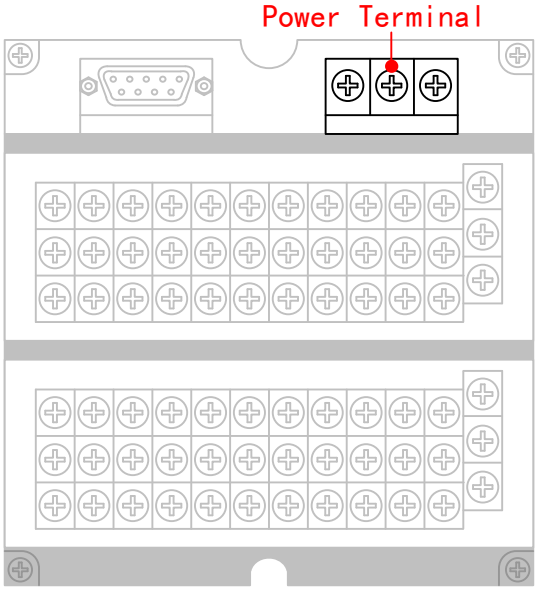
●Connect a fuse (between 2A and 15A) to the power line.

Wiring Procedure

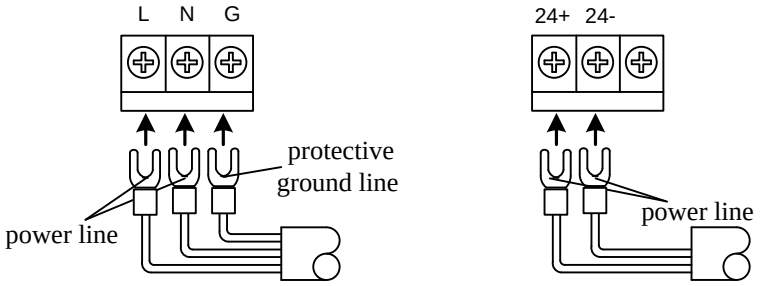
1.Connect the power supply wires and the protective ground wire to the power terminals.

2. Turn on the power.

The position of power terminal in the rear terminal



Terminal Arrangement



Relay Specifications

Item	Specification
Input voltage	85VAC ～ 265VAC
Input frequency	50Hz

2.6 24VDC TRANSMITTER POWER WIRING（OPTION）

Transmitter power output

CAUTION

●Never short-circuit the power supply terminals or apply an external voltage, otherwise damage to the instrument may result.

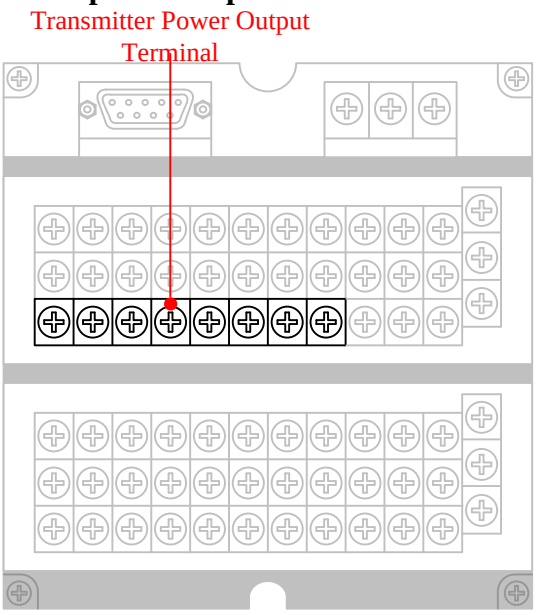
Wiring Procedure

1. Turn OFF the instrument and remove the cover of the rear terminal.
2. Connect the power line of transmitter to the output terminal.
3. Fit with the terminal cover and turn on the power.

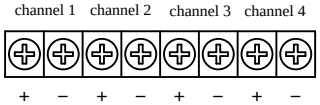
Note

●Remove the cover for the option terminal can be expediently to wiring. To prevent contact badness, replace the terminal cover and fasten it with screws.

The position of transmitter power output terminal in the rear terminal

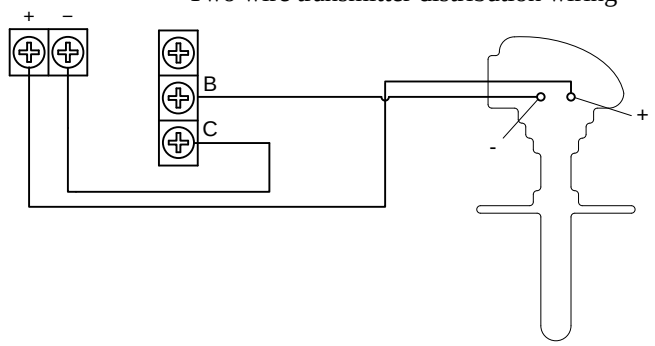


Output channel arrangement of transmitter power



Wiring Diagram

Two wire transmitter distribution wiring



24VDC **Transmitter Power Supply**

Loop： 4

Output voltage： 22VDC ～ 25VDC（rate output current）

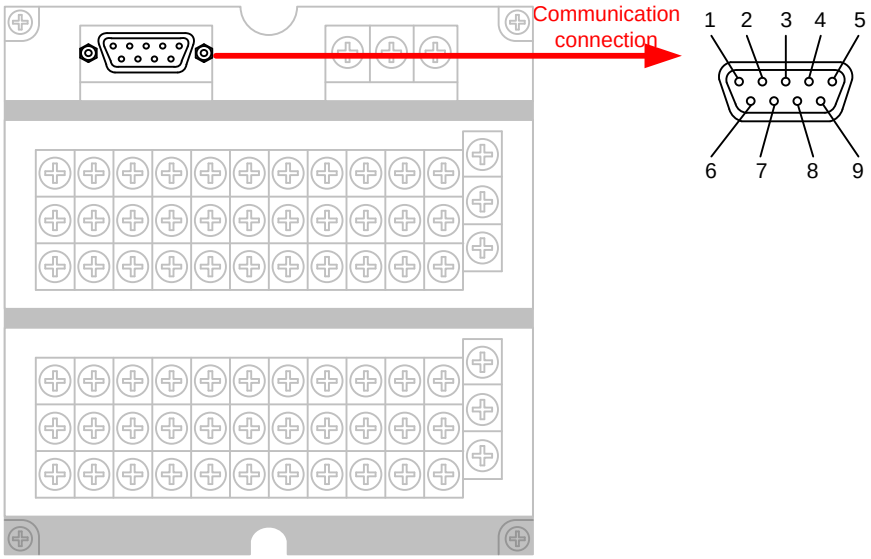
Maximum output current: 65mADC（over-loading protect current: about 90mADC）

2.7 RS232C/RS485 COMMUNICATION WIRING

Here explains RS232C/RS485 communication wiring. Be sure to read this part before connecting.

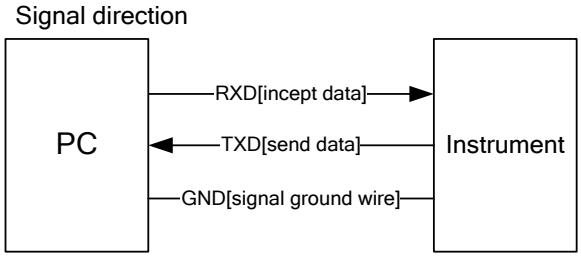
Wiring Procedure

RS232C/RS485 **Communication wiring position in the rear instrument.**

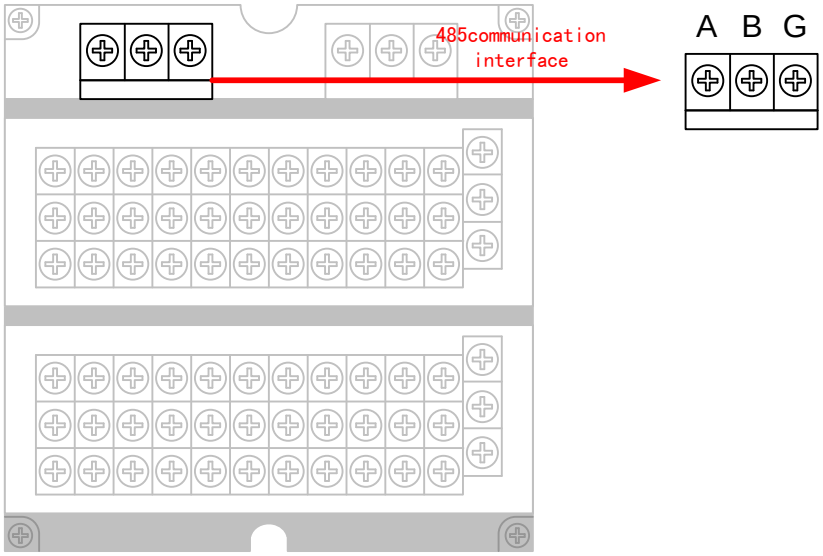


Pin number	Signal Name	Description
2	RXD	Receive data from the RS232 interface, and the instrument input signal
3	TXD	Send data to the RS232 interface, and the instrument output signal
5	GND	Signal Ground

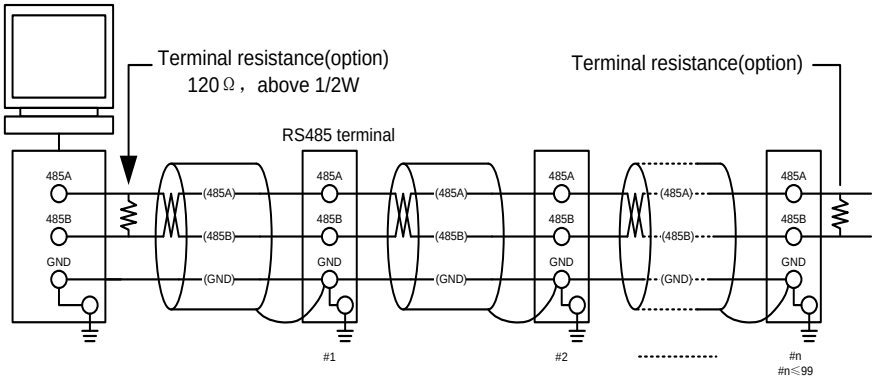
RS232C **connection**



RS485's **position in the rear instrument**



RS485 **connection**



Don't connect terminal resistance between #1 and #n-1

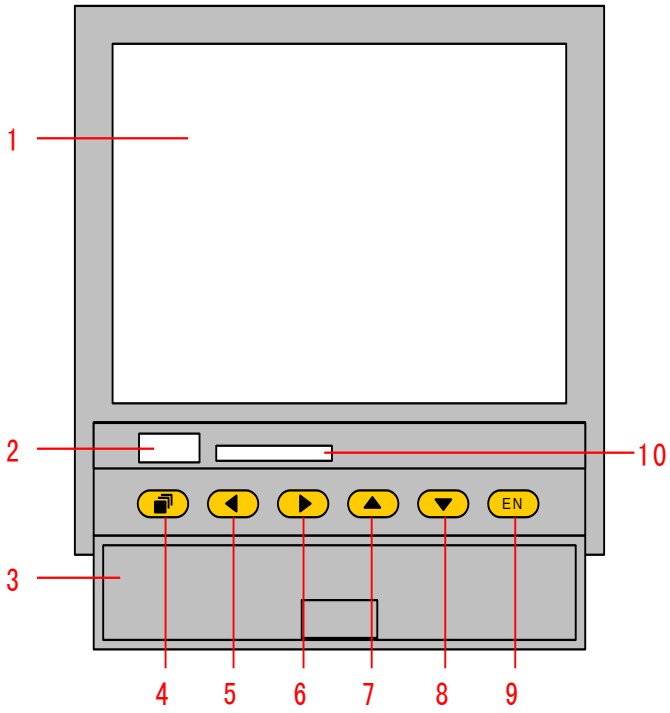
Communication Specifications

Item	Content
Speed(baud rate)	1200/2400/4800/9600/19200/38400/57600/115200
Data format	Eight data bits，One stop bit Optional checkout code（None/odd/even）

CHAPTER 3 NAMES OF PARTS/RUN MODE/COMMON KEY OPERATIONS

3.1 NAMES OF PARTS AND FUNCTIONS

Front Panel



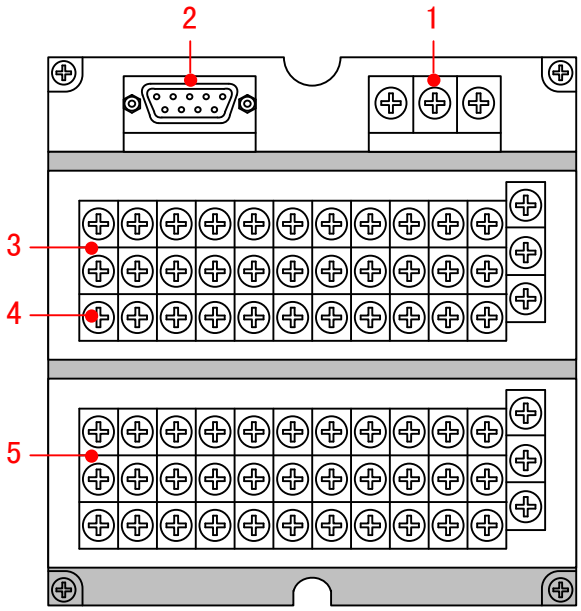
1. LCD **Screen**
Display various operation screens such as the trend display and the setup screen to configure the instrument.
2. USB **port**
USB port, insert the U disk to backup data for use.
3. **Front Cover**
Open this cover to access the keys or inserting or removing the external storage medium such as the USB disk. Keep the cover closed at all times except when accessing the keys and the external storage medium.
4. **PAGE key**
Used to switching operation display. Press this key down with ENTER key at the same time will becoming a combination key, which is used to enter the setting mode.
5. **LEFT key**
Used to move cursor to left in run mode and setting mode, used to search forward.
6. **RIGHT key**
Used to move cursor to right in run mode and setting mode, used to search afterward.
7. **UP key**
Used to increase the value that cursor indicated, and switches channels on the screen.
8. **DOWN key**
Used to decrease the value that cursor indicated, and switches compress ratio on the screen.
9. **ENTER key**

Used to execute the function of button that cursor indicated. It also display the input keypad when the value that cursor indicated can be edited. On history trend screen, you can switch replay mode between continuous time mode and select time mode.Enter configuration screen by using Enter key and Page key.

10. SD **card port**

Used in automatic backup and data backup.

Rear Panel



1. Power terminals

Connect the power cord and ground protective line.

2. RS232 Port and RS485 Port

RS-232 port/ RS485 port is used to connect the interface cable.

3. Relay output terminals

Connect the relay output alarm cable.

4. 24 VDC Power Supply for Transmitter

Provide 24 VDC power line to transmitters.

5. I/O signal terminals

Connect the input signal cable of the item being measured or output signal cable of analog current.

Note: For the details, please refer to 『Before using the instrument』 chapter.

3.2 INSERTING/REMOVING THE EXTERNAL STORAGE MEDIUM

This section describes the procedures to insert and remove the external storage medium.

USB disk and SD card can be used as external storage medium.

For the handling procedure of the storage medium, see section 『back up history data』.

Procedure

Inserting the storage medium

1. Open the front cover. Insert the U disk and SD card into the USB port.
2. The instrument detects the U disk and SD card in the drive automatically.
3. Enter Backup screen, and prepare to back up data.

CAUTION

●Keep the front cover closed during operation except when accessing the external storage medium. This will protect the storage medium and the drive from particles such as dust.

●Keep the metal face upper when inserting the U disk, otherwise the U disk can't be inserted.

●If you are using a commercially available U disk or SD card, be careful of static electricity.

●It is recommended using our company's products.

Remove the storage media

Make sure there is no data saved in storage media

Caution

●The access lamp is lit while the storage medium is being accessed.

●A message "Data are being saved to the medium." is displayed while data are being saved to the medium.

Description

Formatting external storage media

Use the external storage medium which has been formatted.

Please use the PC to carry on the formatting for the USB flash drives and choose FAT 32 system, because this product doesn't provide the formatted function.

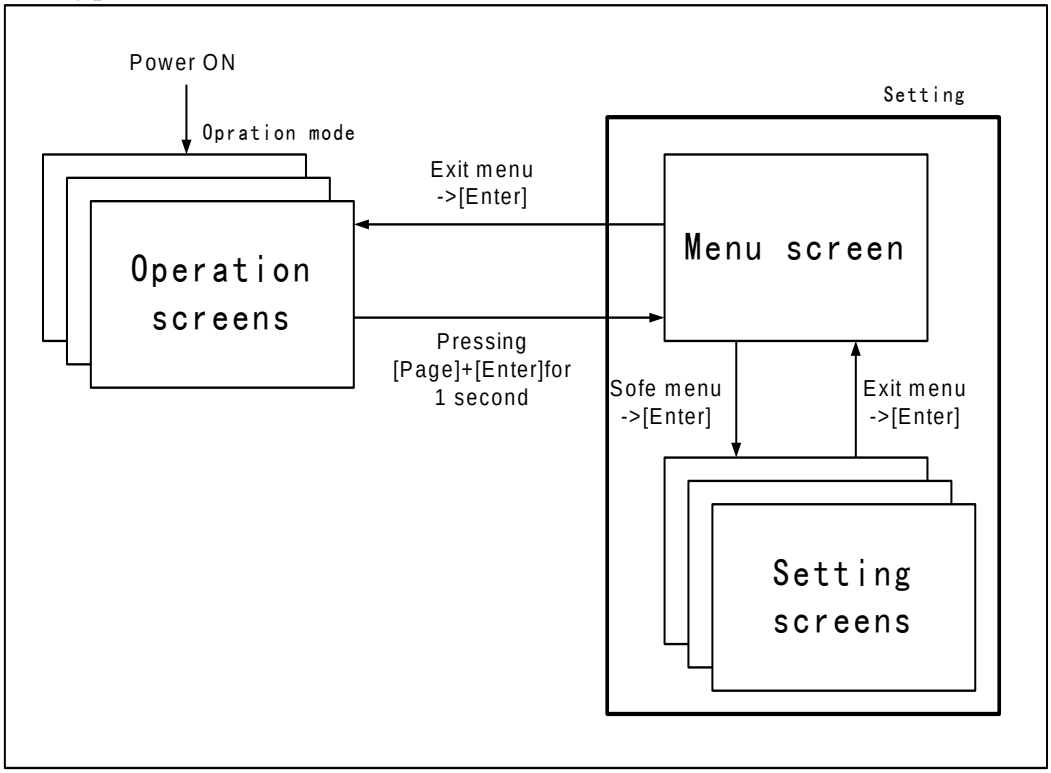
Specification

Item	Content
USB port	Support the USB 2.0 protocol. The maximum capacity is 4GB
SD card port	Standard SD card, don't support SDHC card.The maximum capacity is 2GB

3.3 RUN MODE

There are two run modes: operating and setting. This section describes the functions and relationships of the two modes.

Mode Types



Mode Type	Content	Possible operations
Operation Mode	Data display and query mode of operation. This mode is entered when the power is turned ON. Use [Page Down] to switch the screen, while pressing the [next page] key and [confirmed] key to enter the configuration mode for more than 1 second.	Display measured /operated data Data acquisition ●Data printing Operation related to the file on the external storage medium.
Setting mode	Operations such as measurements, alarm detection, and data acquisition are continued. This mode is entered by pressing the [Page] and [Enter] key for one second at the setting mode menu. Measured data can't be displayed in this mode. Continue to do measurement, alarm detection, data storage and other operation.	●Set a variety of configuration parameters

3.4 CONFIGURING THE FUNCTIONS

Setting Mode

The configuration mode is used to set the various parameters of the running system.

> Note
>
> Change some system parameters will affect the data acquisition. We Suggest backing up data before the change.

Setting Items

User can carry out the following content in configuration mode:

Setting system and recording parameters
Setting signal input parameters
Setting alarm parameters
Setting analog output parameters
Setting accumulation and reports parameters
Setting communication parameters
Setting display parameters
Setting print parameters
Clearing data in the instrument

3.5 COMMON KEY OPERATIONS

This section describes common key operations which are often used.
[Left and right key] [Left key] [Right key]
[Up and down key] [Up key] [Down key]

Key operations in the running mode

Entering the running mode

1. Enter the running mode directly after power on
2. Select [Exit] to enter the running mode in the configuration mode.

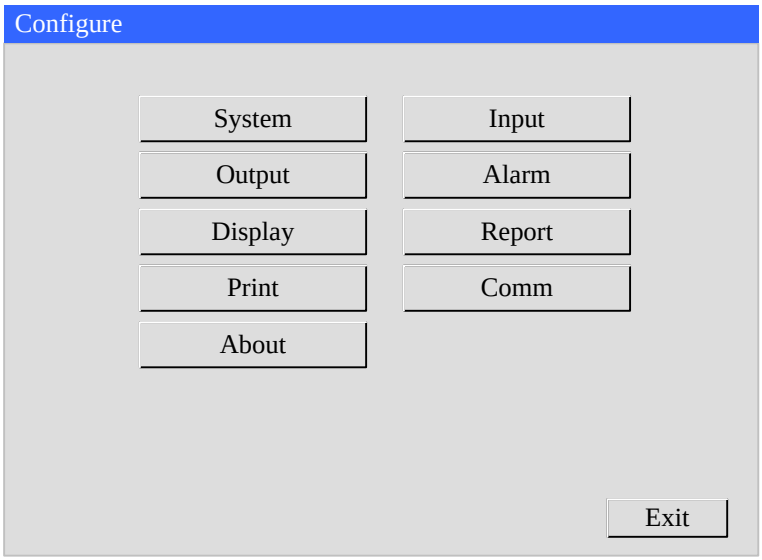
Switching the screens under the running mode

Press [Page] to display each running screen in turn.

Key operations in the configuration mode

Entering the configuration mode

1. Under the running mode, Press [Page] and [Enter] to enter the configuration screen.
2. Move the cursor and press the [Enter] to enter each configuration screen.



Selecting the parameter

Used [Left] and [Right] to move the cursor (blue) to the appropriate parameter or operation key.

Confirming operation

Press [Enter] to confirm the settings.

Modifying the parameter

There are three types of the revisable parameters, namely, to adjust the input parameters, edit the input parameters and select input parameters.

●adjust the input parameters

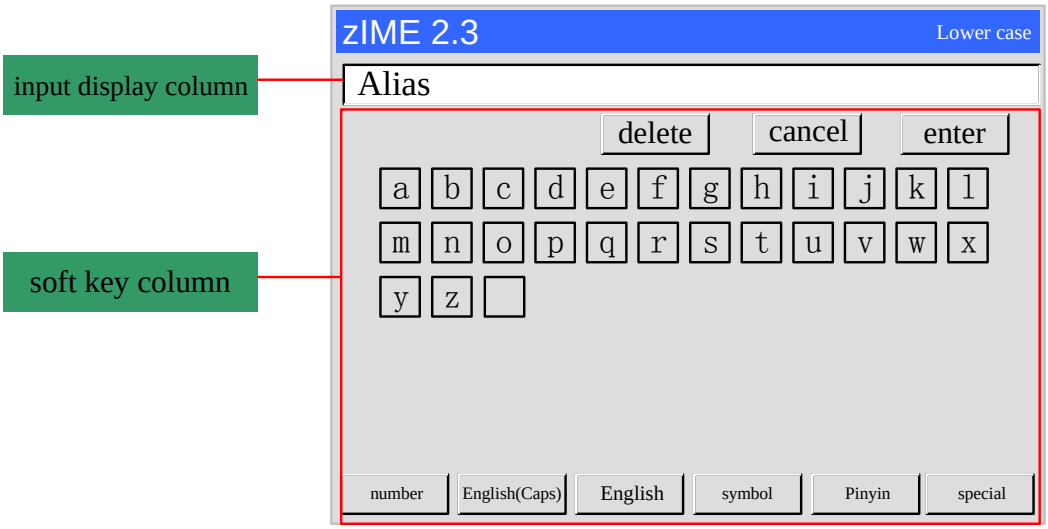
Use [Up] and [down] to set the cursor to adjust the content. [Enter] has the same function with [the up key] , except the function for pressing long.

●edit the input parameters

If the editorial content is a value, use [up] and [down] key to adjust subtlety the

parameters, and press [enter] to modify in the pop-up input panel .When the parameter can be edited, user can input Number, English (Caps), English, Symbol.

●selecting input parameter
Press key [Up], [Down] [En] to pop up selection list, and use key [Up], [Down] to move cursor. [En] is used to confirm selections; [Page] means cancel.
Move the cursor to the parameters which need editing, then an input panel will pop up after pressing [Enter], and the user can input.
Input Number/English (Caps)/English/Symbol
Used in inputting range, unit, tag etc.



Procedure

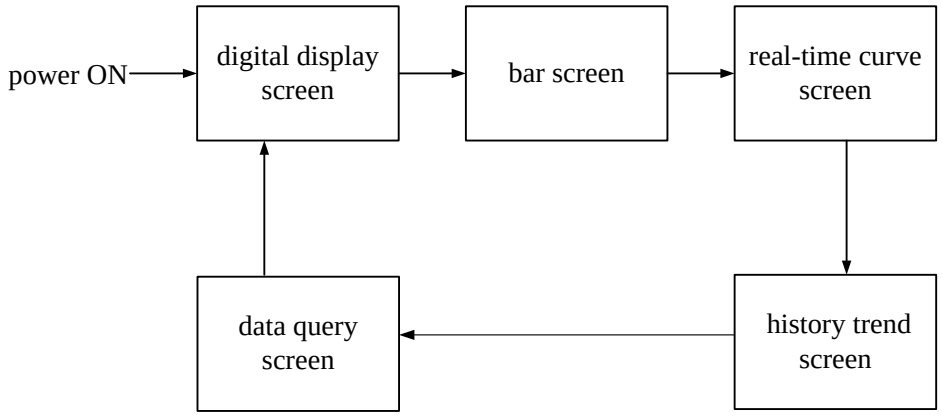
[Left][Right]: Move the cursor to the soft key or input method.
[Up][Down]: Switch accent characters when the cursor is in the alphabet characters,
[Page]: Switch the cursor's to【En】key.
[En]: Input the character to the input field, which under the place of cursor.
Cursor at [Delete]: Delete the last character in the input field.
Cursor at [Cancel]: Exit the input panel, cancel the editing.
Cursor at [Enter]: Exit the input panel, confirm the editing.
If the cursor is at the input method area, you can switch it to the soft key area.

CHAPTER 4 DISPLAY SCREENS AND ITS FUNCTION

4.1 SWITCHING OPERATION SCREENS.

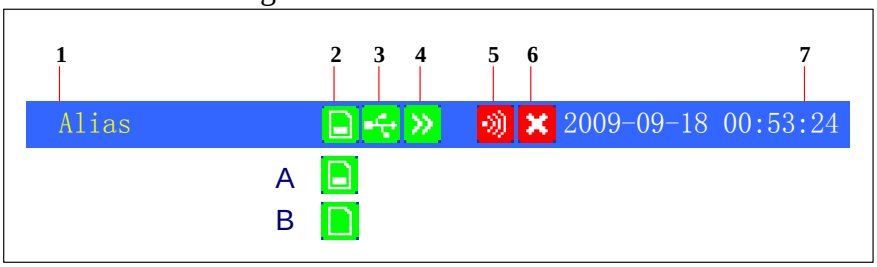
This chapter describes the screen (operation screen) used to display the measured / computed data.
The operation screens are composed of digital display, bar, real-time trend, history, data query screen.
Alarm summary, data print (additional function) and backup (additional function), the cumulative report (additional specification) , power-down recording and system logs and other screens enter through the data query screen.

Use the [Page] key to switch each screen.



4.2 EXPLANATION OF THE STATUS DISPLAY SECTION

The following information is displayed in the status display section during the operation mode and the configuration mode.



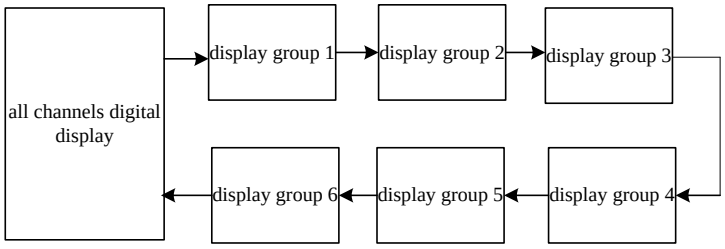
1**. Screen name column**
Data show the combination number of screen display, if not use the combination number, then show 【device name】. Data query screen and the configuration screen show the display name.
2. SD **Card Connection logo**
A: SD card connection is working.
B: Automatic backup of data is being written (A/B displays in turns.).
No show: No SD card connector.
3. USB **Device Identification**
Display: There are USB devices and instrumentation connections.
No Show: No USB devices and instrumentation connections.
4. **Circulation display flag**
Circulation icon： Circulation Display each group
None： Fixed screen, there is no circulation.
5. **Relay output flag**
Display icon: There are alarms generated.
No Show: No alarm generated.
6. **AD board working state flag**
No Show: the instrument is working well.
Display icon: abnormal working state of AD board.
Note: if the instrument displays his flag, this means it doesn't function well, please contact the supplier.
7. **Current data and time**

4.3 DIGTAL DISPLAY SCREEN

The digital displays measured / computed data. On the way of display, please refer to the section 『switch to run the screen』.

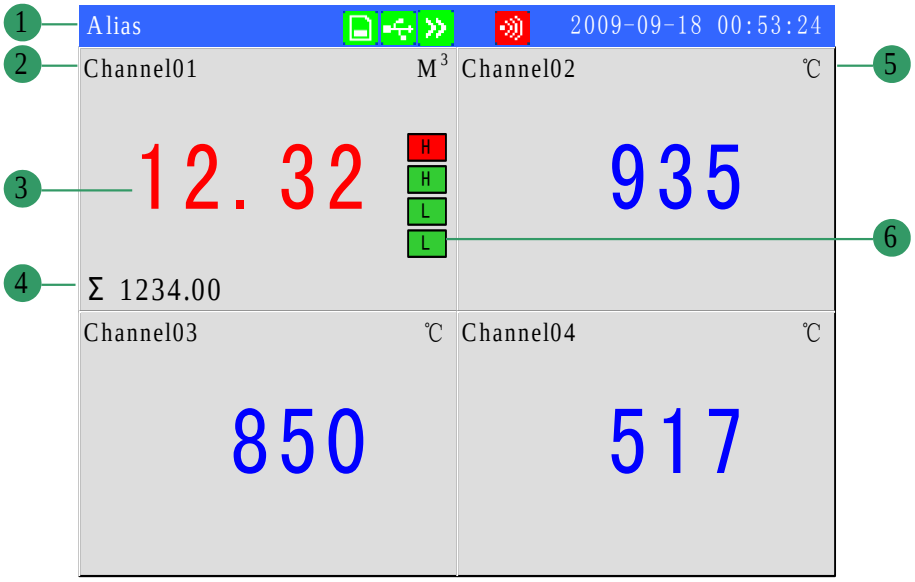
Use [up and down keys] to switch displayed combinations .It can display up to 6 combinations.If display of combinations don't show configuration, skip this display combinations.

The order to switch combination is shown in the following picture:



Use [Enter] to start or stop the automatic switching function of display combinations, every 5 seconds automatically switch to the next combination curve, with a status bar icons.

Screen dispays as follows:



1.Show combination numbers, all channels show 【device name】
2.Channel tag, can be set. With regard to setting method, See section『Channel Tag and Unit Setting』
3.Measurement of channel /computed data. Blue is Normal, red is alarming

Note

Measure the channel's data display

When measuring data of measurement channel anomalies (see below), the screen shows measurements for —.——.

Data exception

4-20 mA : signal is bellow2 mA.

1-5V: measured signal is bellow 0.5V, and the [burnout] display an error flag..

The thermocouple burnout, and the [burnout set] display an error flag.

The thermal resistence burnout, and the [burnout set] display an error flag.

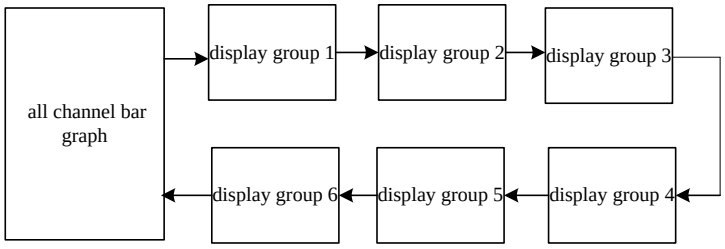
4.Channel accumulation value. It displays when the user selects [channel accumulated] function.
5.Channel unit can be set. With regard to setting method, see section『Channel Tag and Unit Setting』
6.Alarm symbol. 4-channel alarm can be set up, Green is normal, red is alarm.

4.4 BAR GRAPH DISPLAY

Bar graph displays the measured / operated data. On the way to show, please refer to 『switch running screen』

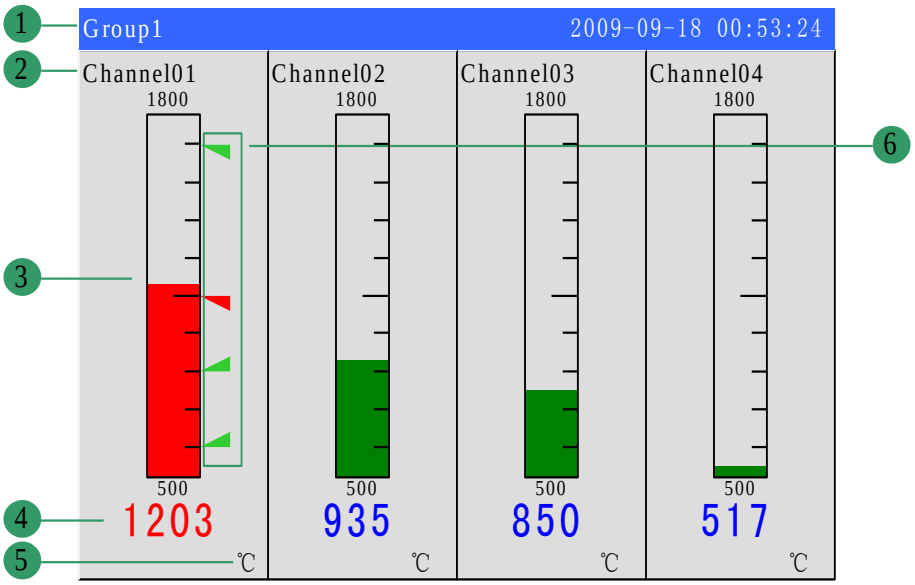
Using [up and down keys] to switch combinations of display. It can display up to 6 combinations.If display of combinations don't show configuration, skip this display combinations.

The order to switch combination is shown in the following picture:



Use [Enter] to start or stop the automatic switching function of display combinations, every 5 seconds automatically switch to the next combination curve, with a status bar icons.

Example of screen display is shown in the following picture:



1.Show combination numbers, all channels show 【device name】

2.Channel tag, can be set. With regard to setting method, See section『Channel Tag and Unit Setting』

3.Bar. Bar chart ruler has the length of 10 grids, and the length of filling color represents proportion in percent. Green is normal, red is alarm.

4. Measurement of channel /computed data. Blue is normal, red is alarming

Note

Measure the channel's data display

When measuring data of measurement channel anomalies (see below), the screen shows measurements for —.——.

Data exception

1-5V: Measured signal is bellow 0.5V, and the [burnout] display an error flag..

The thermocouple burnout, and the [burnout set] display an error flag.

The thermal resistence burnout, and the [burnout set] display an error flag.

5. Channel unit can be set. With regard to setting method, see section『Channel Tag and Unit Setting』

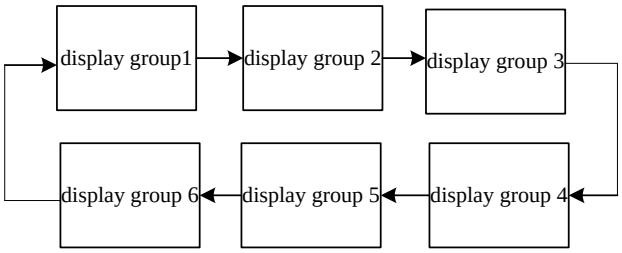
6. Alarm symbol. 4-channel alarm can be set up, green is normal, red is alarm. The place in which the warning signs are located in the bar is where the alarm sets limits in the range of the position, which is only effective against H/L alarm.

4.5 REAL-TIME TREND SCREEN

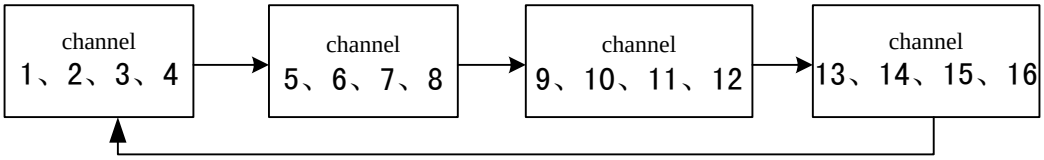
The waveform displays measured / operated data. On the way to show, please refer to 『switch running screen』

Using [up and down keys] to switch combinations of display. If display of combinations don't show configuration, skip this display combinations.. When all the combinations show no configuration, each 4-channel has circular display according to the order of combination of channels.

●Combined mode of curve cycle

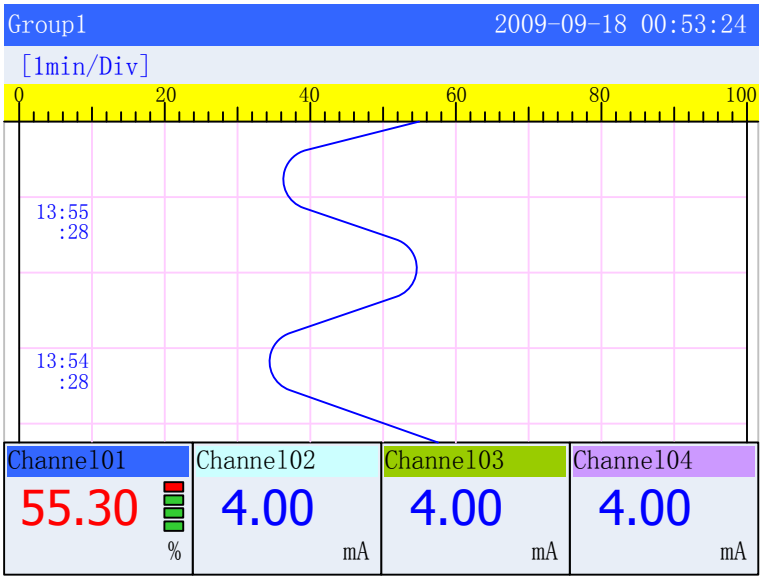


●Uncombined model of curve cycle

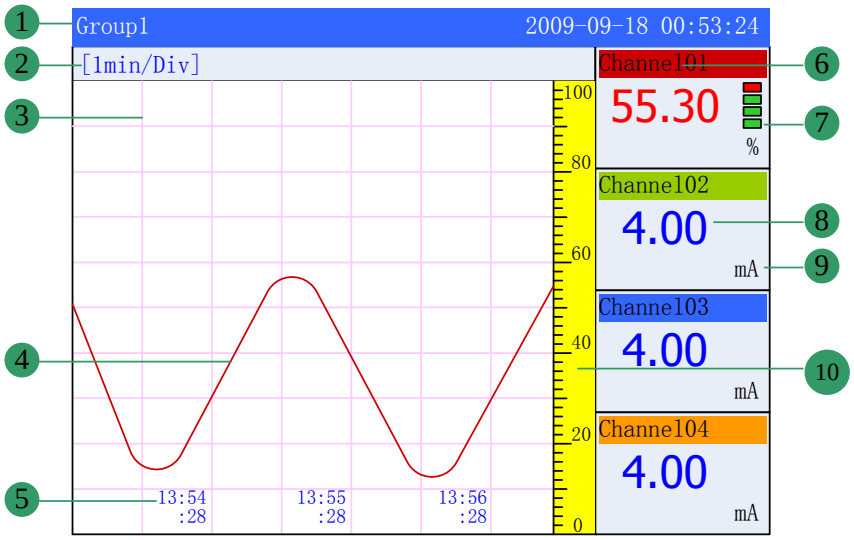


Use [Enter] to start or stop the automatic switching function of display combinations, every 5 seconds automatically switch to the next combination curve, with a status bar icons.

An example of Real-time curve show (vertical)



An example of Real-time curve show (horizontal)



1.Show combination numbers, all channels show 【device name】
2. Trend cycle. Each grid means the length. The cycle is related with recording interval, each grid time length = recording interval × 30.
3. Grid. Estimate the time and data value.
4. Data trend. Most display 4 trends at the same screen.
5. Time of the current grid.
6. Channel tag, which can be set. With regard to setting method, See section『Channel Tag and Unit Setting』. Background color and this corresponding trend color are identical.
7. Alarm symbol. 4-channel alarm can be set up, green is normal, red is alarm.
The place in which the warning signs are located in the bar is where the alarm sets limits in the range of the position, which is only effective against H/L alarm.
8. Measurement of channel /computed data

Note

Measure the channel's data display
When measuring data of measurement channel anomalies (see below), the screen shows measurements for#####。
Data exception
4-20 mA : signal bellows 2 mA.
1-5V : measured signal is bellow 0.5V, and the [burnout] display an error flag..
The thermocouple burnout, and the [burnout set] display an error flag.
The thermal resistence burnout, and the [burnout set] display an error flag.

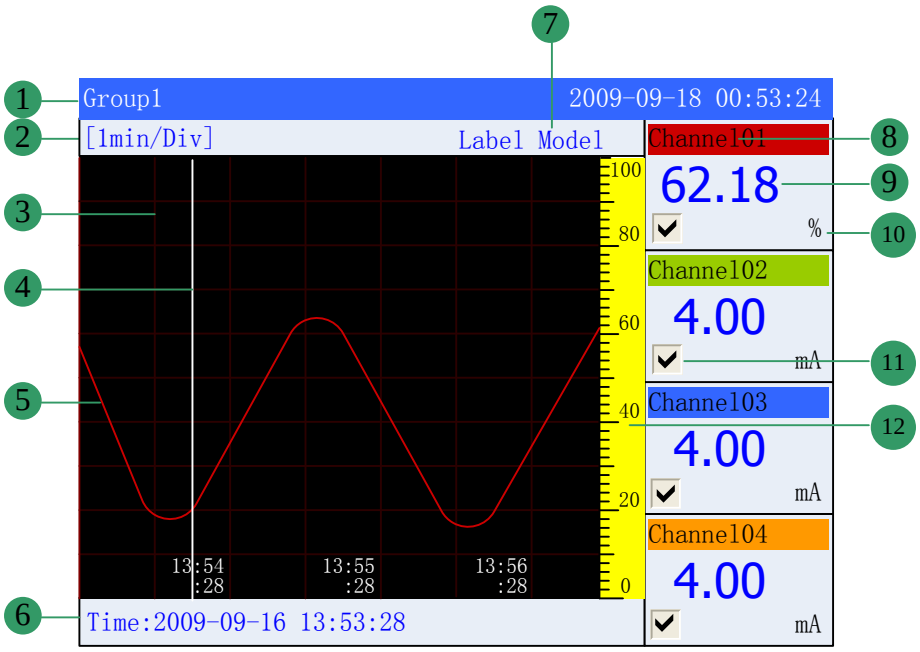
9. Channel unit can be set. With regard to setting method, see section『Channel Tag and Unit Setting』
10. Scale. Display the percentage of the trend.

Curve refresh: every pixel in the timeline of LCD screen timeline represents a record of each interval. Each interval in the curve moves once.

4.6 HISTORY TREND SCREEN

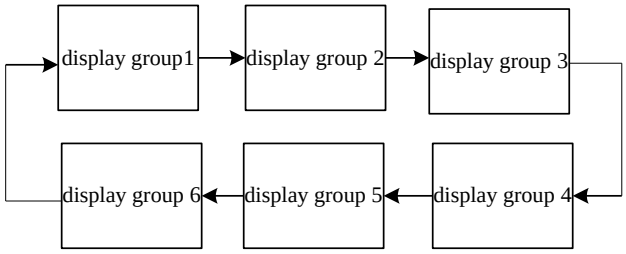
Display the measured / operated data stored in the memory with historical curve.
On the way to show, please refer to 『switch running screen』
There exist two methods to search historical data. One is continuous and the other is fixed point. Historical Curves show no alarm.
Curve direction on paper is according to the configuration display, with horizontal or vertical two options.

Horizontal historical Curve

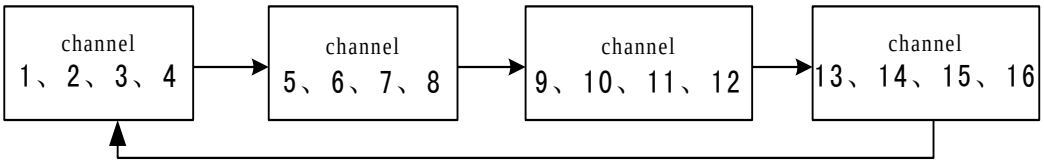


1.Show combination numbers, all channels show 【device name】
2. Trend cycle. Each grid means the length. The cycle is related with recording interval, Time length = recording interval ×Zoom multiple×30.
3. Grid. Estimate the time and data value.
4. Searching stick. Estimate the time and data value.
5. Data trend. Most display 6 trends at the same screen.
6. Searching time. Show the time where the cursor is located in the trend.
7. There exist two methods to search historical data. One is continuous and the other is fixed point.
8. Channel tag can be set. With regard to setting method, See section『Channel Tag and Unit Setting』.. Background color and this corresponding trend color are identical.
9. Historical data of channels. Show the data of channels that the Meter recorded.
10. Channel unit can be set. With regard to setting method, see section『Channel Tag and Unit Setting』
11. Trend display symbol. "√" display, "×" hide.
12. Scale. Display the percentage the trend.

Procedure:
Continuous state
Switching curve combination
Using [up and down keys] to switch combinations of display. If display of combinations don't show configuration, skip this display combinations.When all the combinations show no configuration, each 4-channel has circular display according to the order of combination of channels.
Combined cycle mode of curve



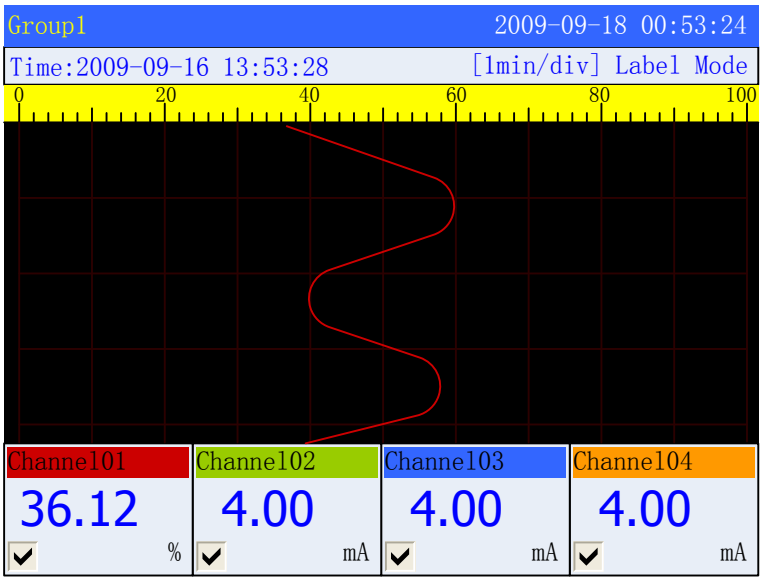
Non-combined cycle mode of curve



Continuous state
Uses [Left] and [Right] to move cursor so that forward or backward searching is available. Long press [left and right button] can accelerate continuous mode.
Switch the continuous state and the fixed point state
Press [En] to switch to the fixed point state.

Operation of Fixed point state
Uses [Left] and [Right] to move cursor to searching time. Set the data time to a desired point by using [Up] and [Down]. Press [En], the trend will be moved to the fixed point automatically, and the searching point will at the right side of the screen.
Scaling curve
Use [Left] [Right] to move the cursor to the curve of cycles, and use [Up] [Down] to adjust zoom curve.
Show or hide a curve
Use [Left] [Right] to move the cursor to the curve show / hide, press [Up] or [down], you can hide or show the curve.
Switch the continuous state and the fixed point state
Press [En] to switch to the fixed point state.

Longitudinal history curve



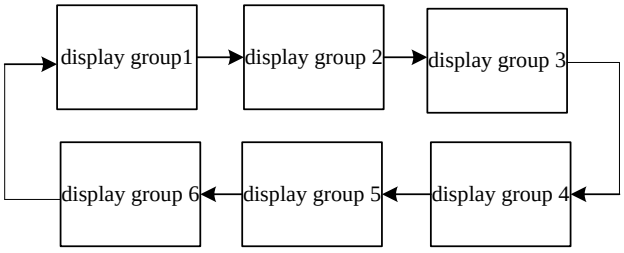
Procedure:

●Continuous state

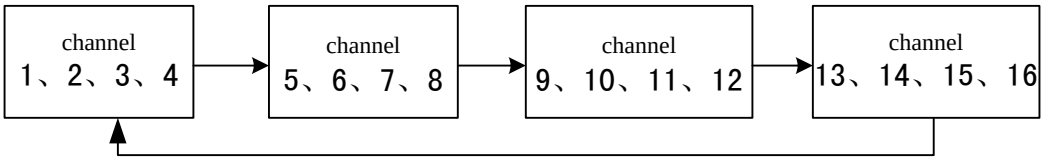
Switching curve combination

Using [up and down keys] to switch combinations of display. If display of combinations don't show configuration, skip this display combinations.When all the combinations show no configuration, each 4-channel has circular display according to the order of combination of channels.

Combined mode of curve cycle



Non-combined cycle mode of curve



Continuous state

Uses [Up] and [Down] to move cursor so that forward or backward searching is available. Long press [up and button] can accelerate continuous mode.

Switch the continuous state and the fixed point state

Press [En] to switch to the fixed point state.

Operation of Fixed point state

Uses [Left] and [Right] to move cursor to searching time. Set the data time to a desired point by using [Up] and [Down]. Press [En], the trend will be moved to the fixed point automatically. The fixed point is on the right hand.

Scaling curve

Use [Left] [Right] to move the cursor to the curve of cycles, and use [Up] [Down] to adjust zoom curve.

Show or hide a curve

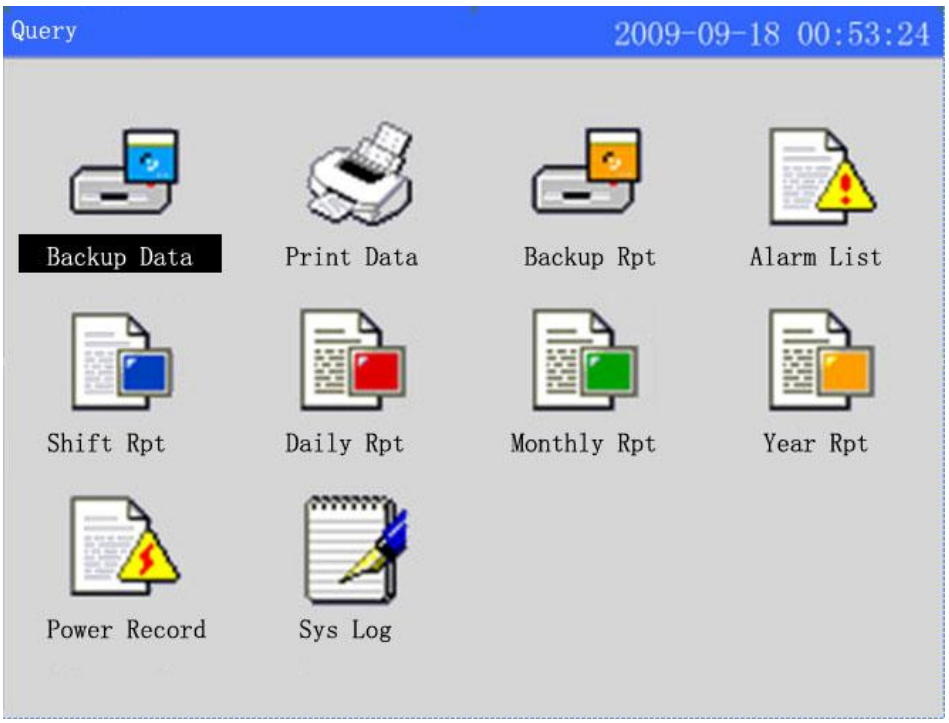
Use [Left] [Right] to move the cursor to the curve show / hide, press [Up] or [down], you can hide or show the curve.

Switch the continuous state and the fixed point state

Press [En] to switch to the fixed point state.

4.7 DATA QUERY SCREEN

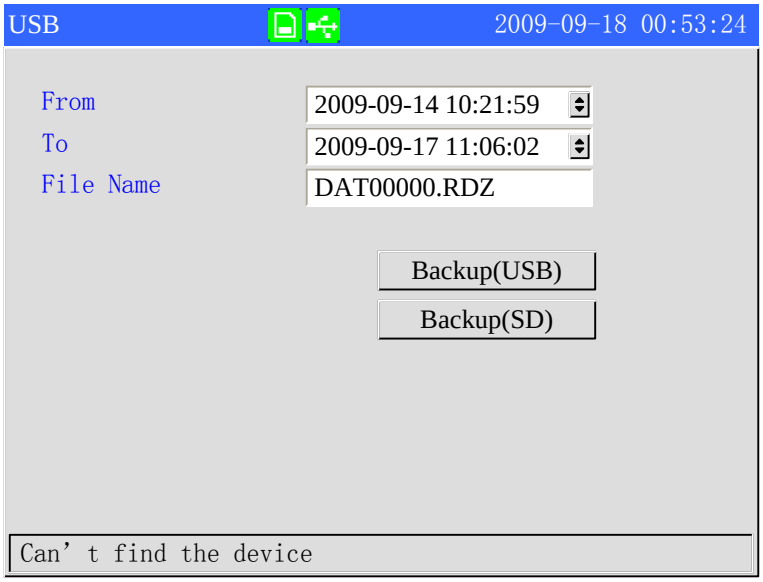
The entrance to the internal data of the instrument (historical data, alarm list, the accumulative amount ,the accumulative report, power-down recording and system logs) for backup, printing, viewing ,etc.



Operation:
Use [left and right button] to move the cursor
Use [En] to enter the corresponding screen

4.8 DATA BACKUP

This section describes how to use the U disk and SD card to backup historical data. On the way to show, please see the section and 【switching the running screen 】

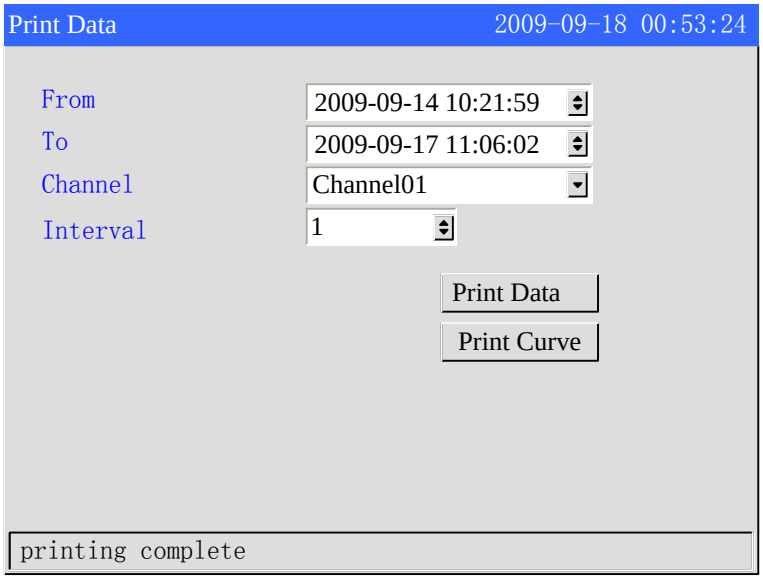


Procedures:

1. Connect USB or SD cards in a right way, after connecting there’s a corresponding icon in the system column.
2. Set the start time and end time
3. Modify the file name, use the [up and down keys] to adjust the file number; use the [En] to edit the file name.
4. Back up your data, move the cursor to【Backup (USB / SD)】button, press [En] key to perform a data- backup manipulation.
5. File storage path is DATA / 【Instrument Name】 / DAT00000.RDZ. For the 【device name】,please check the system configuration screen.
6. Use [Page] to return to data query screen.

4.9 DATA PRINTING

This section describes how to use the mini-printer to print historical data.
On the way to display, please see the section 『switching the running screen』



Steps:

1. Connect mini-printer properly.
2. Set the start time and end time.
3. Set print channel (or combination) and print interval.
4. Printing curves or data.
5. Use [Page] to return to data query screen.

Description

Connect the instrument and the printer through the RS232C interface (DB9).

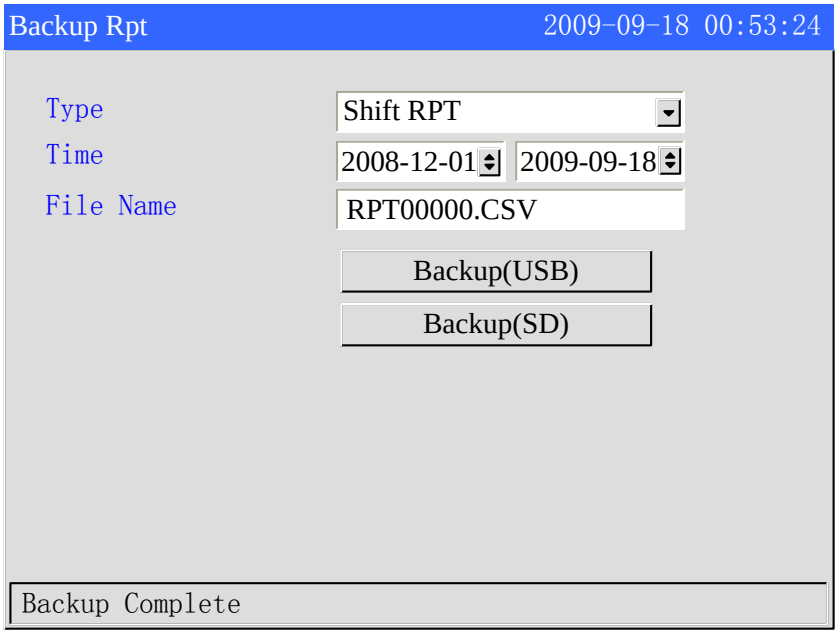
Instrument interface	Micro-printer interface
RXD	RTS
TXD	RXD
GND	GND

Instruments do not need to set the communication parameters.

4.10 REPORT BACKUP

This section describes how to use the U disk and SD Card to back up accumulative report.

On the way to display, please see the section『switching the running screen』



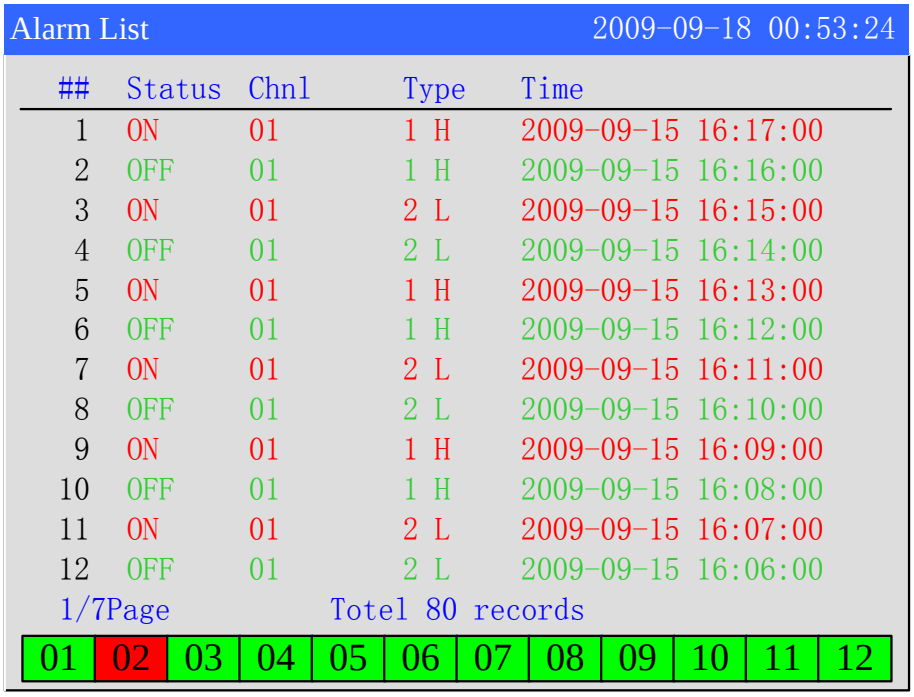
Steps

1. Connect USB or SD cards in a right way, after connecting there's a corresponding icon in the system column.
2. Set the start time and end time
3. Modify the file name, use the [up and down keys] to adjust the file number; use the [En] to edit the file name.
4. Back up your data, move the cursor to 【Backup (USB / SD)】 button, press [En] key to perform a data- backup manipulation.
5. File storage path is DATA / 【Instrument Name】 / RPT00000.CSV. For the 【device name】,please check the system configuration screen.
6. Use [Page] to return to data query screen.

4.11 ALARM SUMMARY

Display channel alarm information and relay output state. It can save up to 80 pieces alarm information.

On the way to display, please see the section and 『switching the running screen』



1.Channel sequence number： Records are arranged according to the stack, the closer time of occurrence is, the more pre-arranged it is.
2. Status: Displays the current record status, alarm, or report cancel
3. Channel: Displays the channels of current record
4. Alarm type. Display the alarm type. Figures represent the 4-way alarm in the number of (1-4), the letter on behalf of alarm type (H, L, I, D).
5. Alarm time. Displayed the alarm occur
6. Relay state. Display current relay output state.

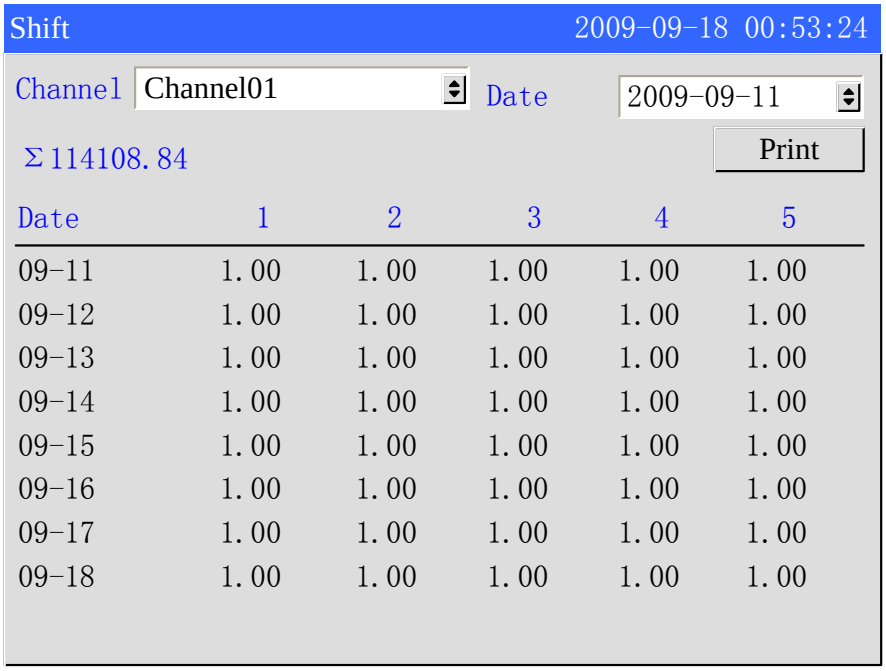
Relay type	Normal open relay
Green	Open
Red	Close

7. Use [left or right button] or [up and down keys] to inquire next page
8. Use [Page] to return to data query screen

4.12 ACCUMULATIVE SHIFT REPORT

According to the configuration to set shift report and time, display accumulative shift report namely the cumulative amount of each shift, generated reports on a daily basis. If there's no cumulative channel or number of shift report, the entrance to shift report does not provide.

On the way to display, please see the section 『switching the running screen』



Operation:

Channels: use [up and down keys] to modify the channel.

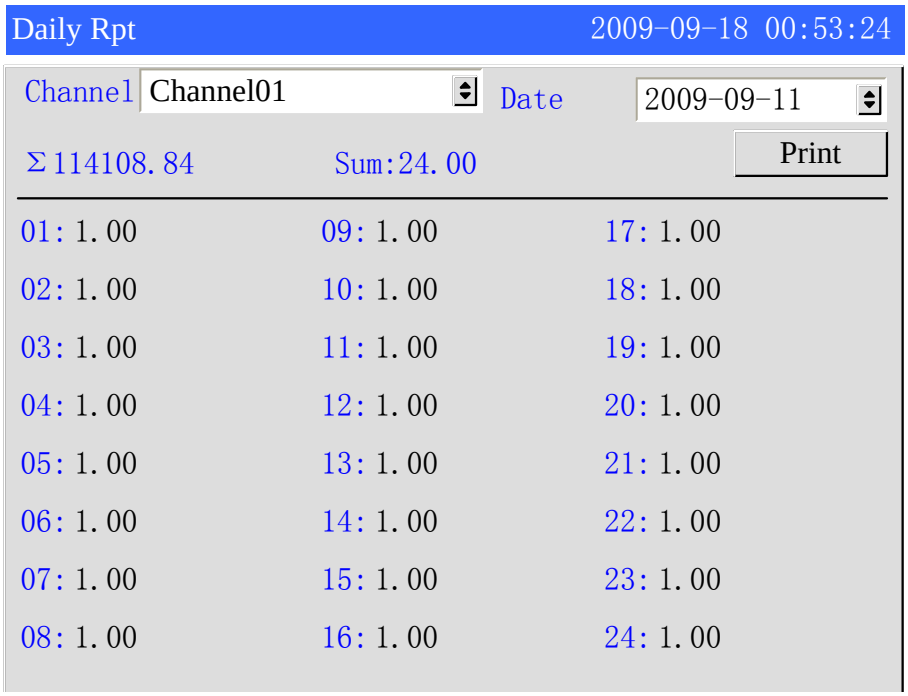
Date: Use the [up and down keys] to modify the query start date; use the [En] to start query.

Print: Use of micro-printer to print the screen display contents.

Use [Page] to return to data query screen.

4.13 ACCUMULATIVE DAILY REPORT

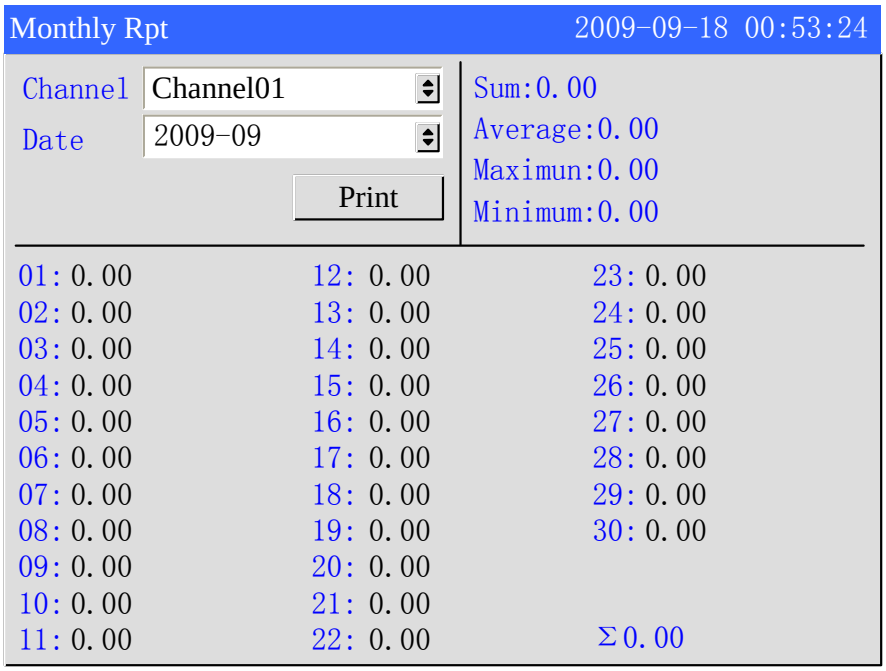
Show the cumulative daily report, namely the cumulative amount per hour, and generate daily report per day.
If there's no cumulative channel, the entrance to daily report does not provide.
On the way to display, please see the section 『switching the running screen』



Operation:
Channels: use [up and down keys] to modify the channel.
Date: Use the [up and down keys] to modify the query start date; use the [En] to start query.
Print: Use of micro-printer to print the screen display contents.
Total: Display the total volume per day.
Use [Page Down] to return to data query screen.

4.14 ACCUMULATIVE MONTHLY REPORT

Show the cumulative monthly report, namely a daily cumulative amount, and generate reports on a monthly basis.
If there's no cumulative channel, the entrance to monthly report does not provide.
On the way to display, please see the section 『switching the running screen』



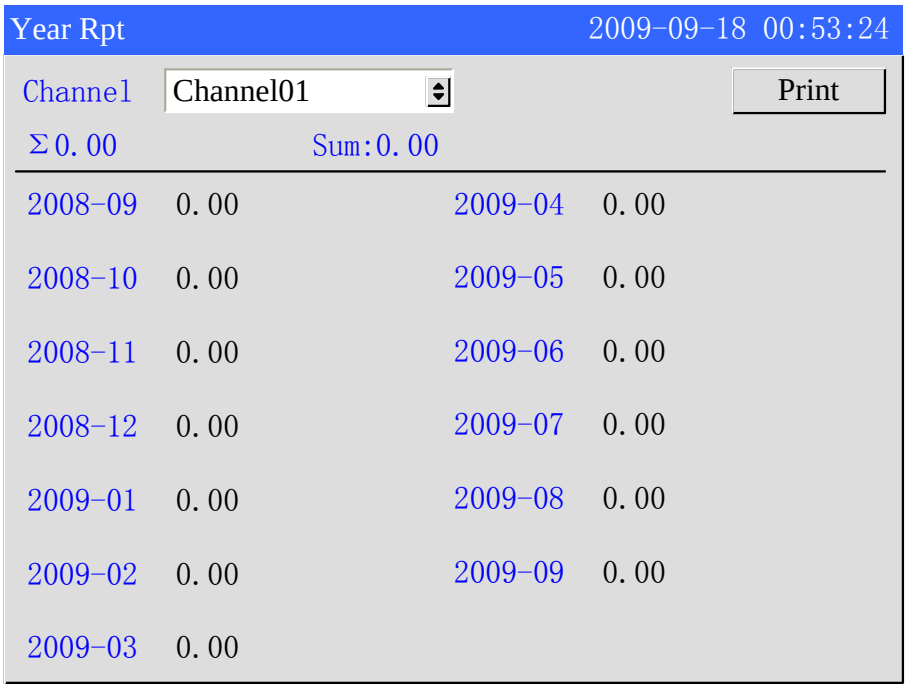
Operation:
Channels: use [up and down keys] to modify the channel.
Date: Use the [up and down keys] to modify the query start date; use the [En] to start query.
Print: Use of micro-printer to print the screen display contents.
Total: Display the total volume per month.
Average: Display daily amount of average usage current month.
Max: Display the maximum amount on current month.
Minimum: Display the minimum amount on current month.
Use [Page] to return to data query screen.

4.15 ACCUMULATIVE ANNUAL REPORT

Show cumulative annual report, namely the cumulative monthly amount, and generate statements of the previous 12 months amount before the current month.

If there's no cumulative channel, the entrance to monthly report does not provide.

On the way to display, please see the section 『switching the running screen』

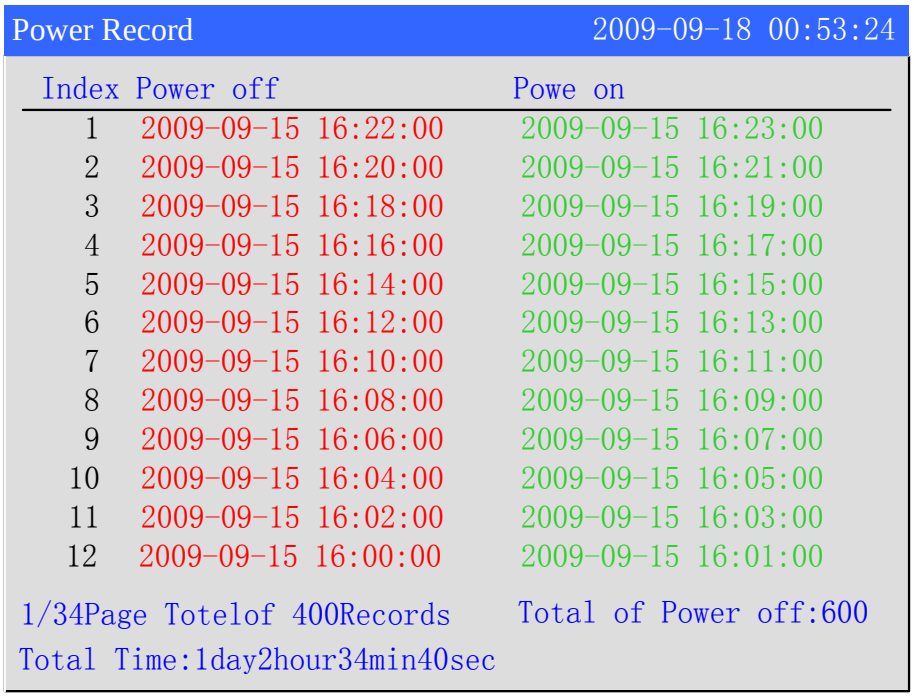


Channels: use [up and down keys] to modify the channel.
Print: Use of micro-printer to print the screen display contents.
Total: Display the total volume per year.
Use [Page] to return to data query screen.

4.16 POWER-DOWN RECORD

Display time of power-down and power-on records, including the power-down and power-on time, power-down frequency and the total time of power-down. It can save up to 400 power-down record.

On the way to display, please see the section 『switching the running screen』



Channel sequence number：Records are arranged according to the stack, the closer time of occurrence is, the more pre-arranged it is.
Power-down time: Power-down time of the Instrument.
Power-on time: power-on time of the Instrument.
Total number of power-down: the total number of power-down records
Total power-down time: accumulated time for each power-down time, accurate to seconds.

Use [left or right button] or [up and down keys] to inquire on next page
Use [Page] to return to data query screen.

4.17 SYSTEM LOG

Display related log of instrument operation.
On the way to display, please see the section 『switching the running screen』

Operation:
Use [left and right button] or [up and down keys] to inquire on next page
Use [Page] to return to data query screen.

Sys Log 2009-09-18 00:53:24

Index	Event	Time
1	Save Alarm Config	2009-09-15 16:23:00
2	Enter Config	2009-09-15 16:21:00
3	Save System Config	2009-09-15 16:19:00
4	Enter Config	2009-09-15 16:17:00
5	Save Alarm Config	2009-09-15 16:15:00
6	Sace Input Config	2009-09-15 16:13:00
7	Enter Config	2009-09-15 16:11:00
8	Save Report Config	2009-09-15 16:09:00
9	Enter Config	2009-09-15 16:07:00
10	Save Display Config	2009-09-15 16:05:00
11	Emter Config	2009-09-15 16:03:00
12	Enter Config	2009-09-15 16:01:00

1/22Page Totel of 256 Records

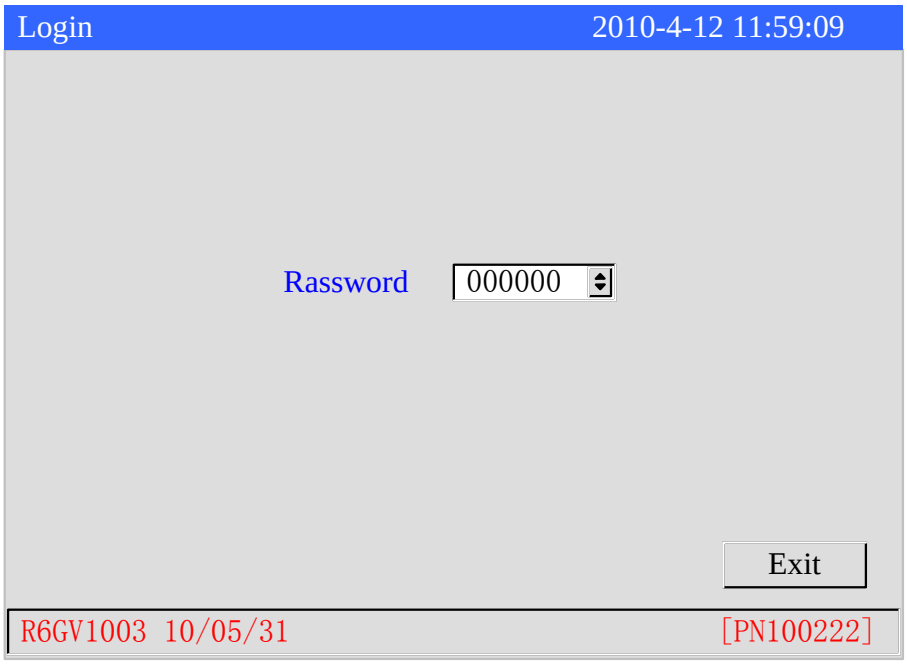
Channel sequence number：Records are arranged according to the stack, the closer time of occurrence is, the more pre-arranged it is.
Event: Operation event.
Time of occurrence: The incident occurred.

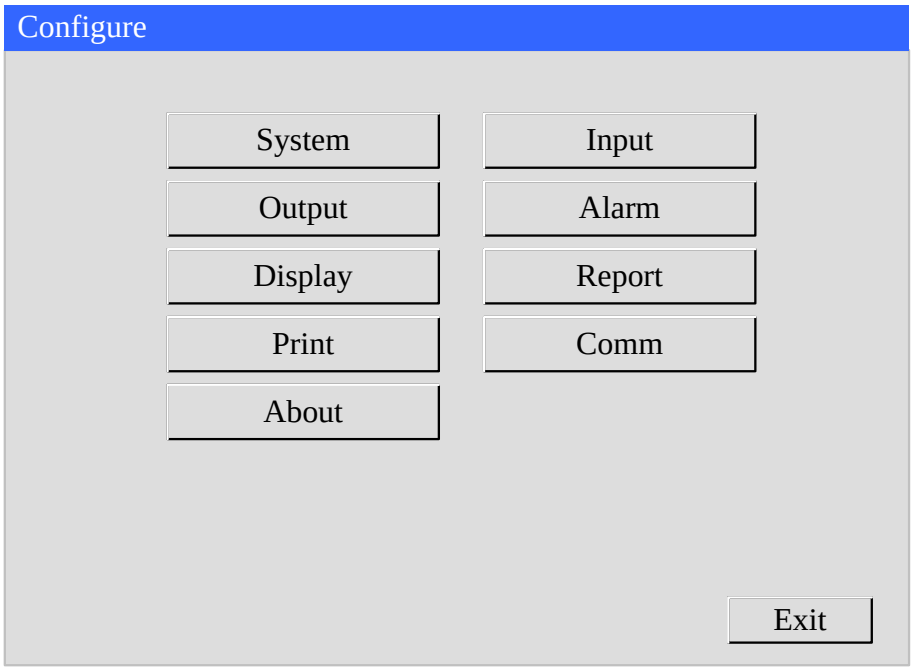
4.18 LOG CONFIGURATION

This section describes how to log configuration.

Operation

Press the [next page] plus [En] to enter the login screen, enter the password, If the password is correct then display configuration entry, select the appropriate configuration entry to set the configuration; password error could not enter.





Press [Quit] button to exit configuration and enter the running screen.

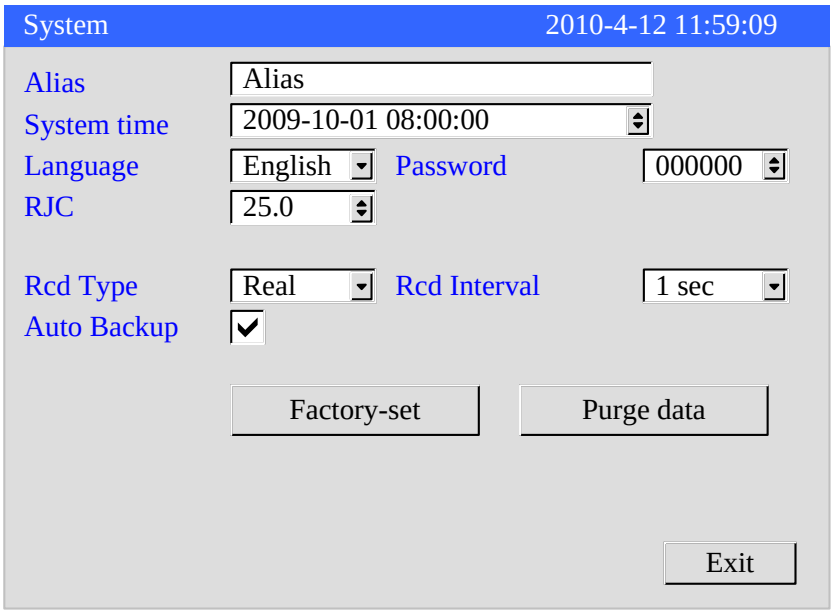
CHAPTER 5 SYSTEM CONFIGURATIONS AND ITS FUNCTION

5.1 SETTING THE DATE AND TIME

Set the date and time of the instrument.

Procedure

Enter 【system configuration】screen, the method to enter please see "log configuration".



Date Time: This field is to set meter's current date and time.

1, use the [left and right button] to move the cursor to the【system time】column.
2, use the [up and down keys] to modify date and time.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

Caution

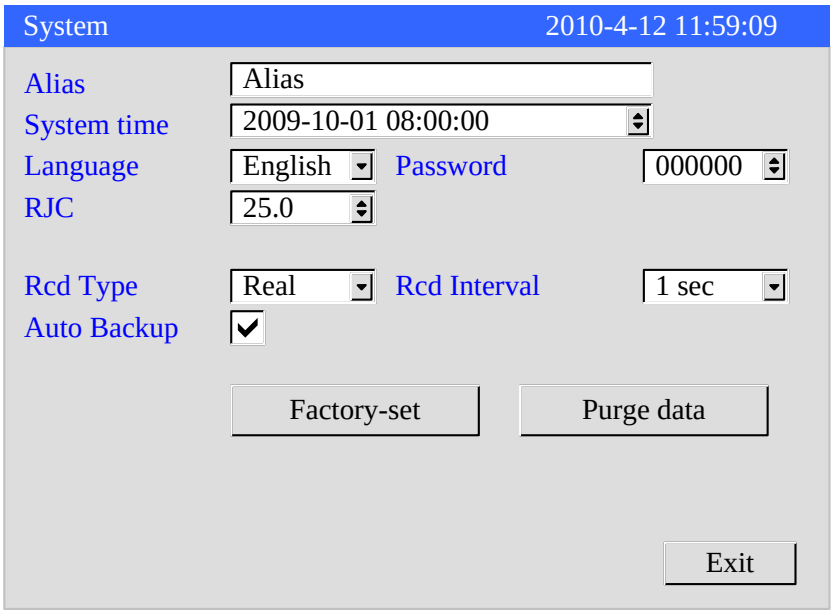
After setting system date / time, those historical data stored in instrument is invalid.
New and effective data begins after setting system date / time.
Before setting system date / time, please back up history data.

5.2 SETTING THE DEVICE NAME

Set the device name; display it on the title bar.
Use that name to create the directory of data backup and automatic backup .

Operation

Enter 【system configuration screen】, the method to enter please see "log configuration".



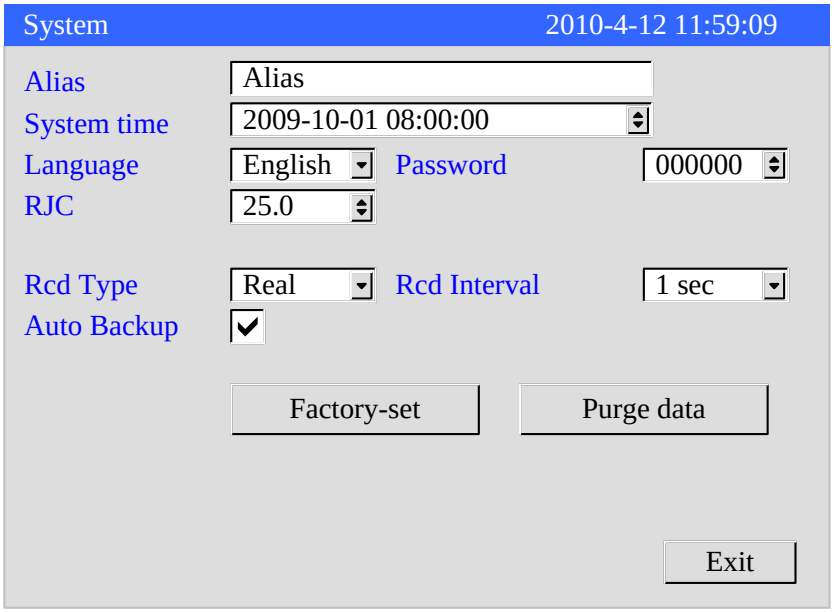
Device Name: This field is to set the device name.
1, use the [left and right button] to move the cursor to the【alias】 column.
2, use the [En] to input on the pop-up input panel, please refer to "common key operation" about the input method.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

5.3 SETTING THE SYSTEM PASSWORD

System password is used to modify configuration parameters and prevent the system parameters from being accidentally modified.
System password is six digits.

Operation

Enter 【system configuration screen】 , the method to enter please see "log configuration".



Password: This field is to set the system password.

1, use the [left and right button] to move the cursor to the【password】column.
2, use the [up and down keys] to change password.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

NOTE

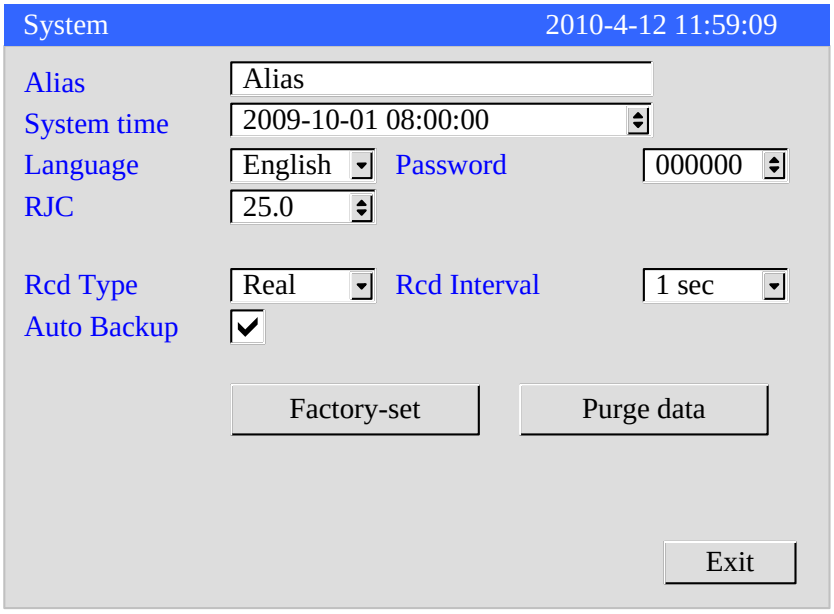
The system password is the only password which can enter the system configuration to modify parameters. If it is lost, modification is unavailable.
The initial password is 000000, after the purchase please change password as soon as possible, and properly preserve it.

5.4 SET SYSTEM LANGUAGE

Display language (English).

Operation

Enter 【system configuration screen】 , the method to enter please see "log configuration".



System Language: The bar is to set system language.

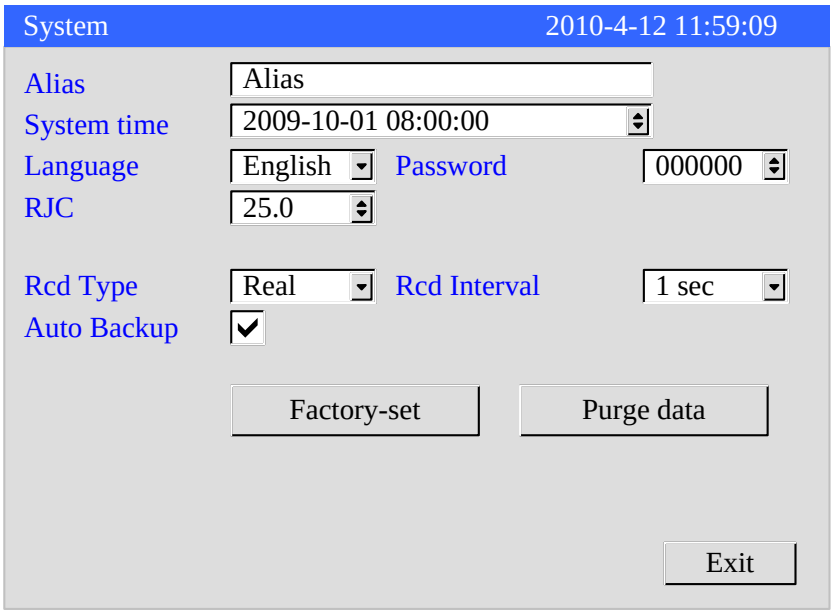
1, use the [left and right button] to move the cursor to the【language】column.
2, use the [up and down keys] to select system language.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

5.5 SET REFERENCE JUNCTION COMPENSATION

Reference junction compensation can tune compensation temperature value of thermocouple

Operation

Enter 【system configuration screen】 , the method to enter please see "log configuration".



Cold-side adjustment: the column is used to set the Cold-side adjustment.

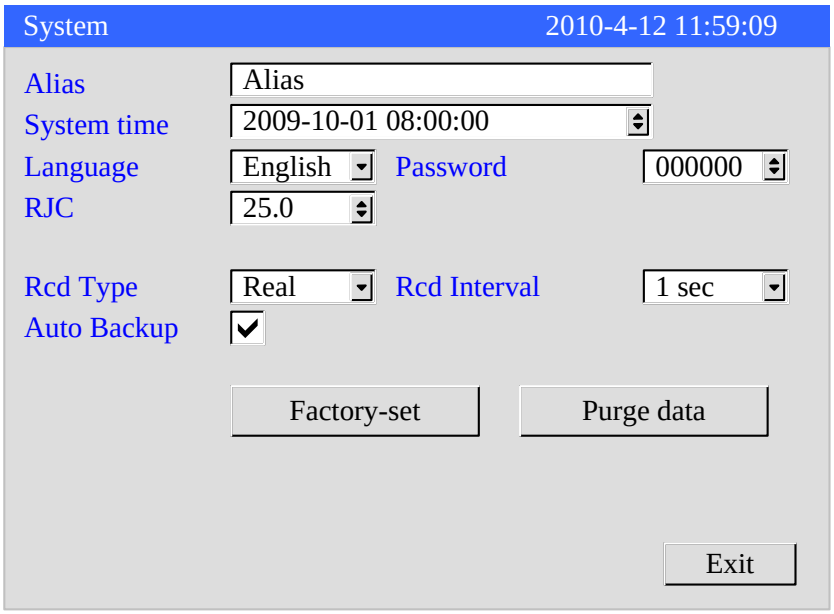
1, use the [left and right button] to move the cursor to the【RJC】 column.
2, use the [up and down keys] to adjust the value of the cold side to the right temperature.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

5.6 IMPLEMENTATION OF THE FACTORY SETTINGS

This section describes the instrument functions of the factory settings and parameters of reset value.
This will clear all stored data in memory of the instrument, including historical data, the total cumulative amount, cumulative reports, alarm list, power-down records, but the system log is not cleared.

Operation

Enter 【system configuration screen】 , the method to enter please see "log configuration".



1, use the [left and right button] to move the cursor to the 【factory set】 button.
2 use the [En] to implement factory setting function.
3 pop up a confirmation dialog box.
Select [Yes], implement the factory settings.
Select [Cancel] or [No], give up the factory settings.

Reset instrument of configuration parameter values, please see the following table:

Configuration	##	Parameter	Reset value.	Notes
System Configuration recording Configuration	1	Device name	Device name / Alias	
	2	System Language	Not affected	No change
	3	Password	000000	
	4	RJC	0.0	Displayed as the cold-side plus adjustment
	5	Recording interval	2 seconds	
	6	Recording type	Real-time value	
	7	Automatic Backup	No	
Channel Configuration	8	Dislay tag	Channel xx / Chnlxx	
	9	Channel unit	%	
	10	Channel type	Current	
	11	Signal type	4-20mA	
	12	Channel precision	2	
	13	Signal range	4.00 ~ 20.00	
	14	Display range	0.00 ~100.00	
	15	Ajust valueK	1.00	
	16	Adjust value B	0.00	
	17	Burnout	Keep	
	18	Square root	No	
	19	Filter	0.0s	
	20	Small-signal resection	0.0%	
Output Configuration	21	Channel	OFF	
	22	Adjust value K	1.00	
	23	Adjust value B	0.00	
Alarm Configuration	24	Alarm delay	0 second	
	25	Alarm hysteresis	0.00	
	26	R alarm time	1	
	27	R alarm time	1	
	28	Alarm type	OFF	
	29	Alarm value	0.00	
	30	Relay	R00	
Display Configuration	31	Display direction	Horizontal	
	32	Trend channel	OFF	
	33	Color	According to the curve of	Set 1-6 color

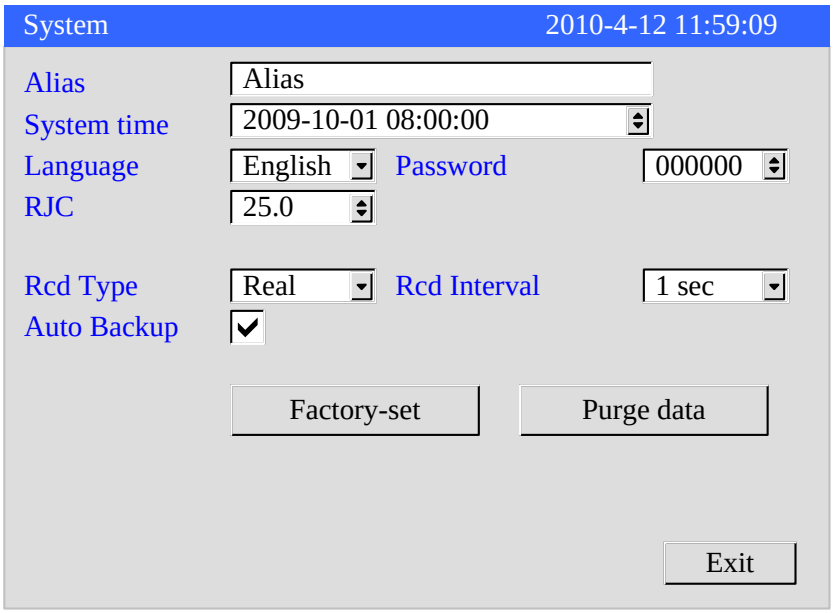
			serial number	
Accumulative Configuration	34	Frenquency	0	
	35	Frenquency time	00	
	36	Cumulative Switch	no	
	37	Initial value	0	
	38	Ratio	1.00	
print Configuration	39	Print by using buttons	No	
	40	Timer print	No	
	41	Timer interval	00:02(H:M)	
Communication Configuration	42	Communication Address	01	
	43	Bytes exchange	2143	
	44	Baud rate	115200	
	45	Parity	None	

5.7 IMPLEMENTION OF PURGING DATA

This section describes the instrument functions of purging data.
Clear all stored data in memory of the instrument, including historical data, the total cumulative amount, cumulative reports, alarm list, power-down records, but the system log is not cleared.

Operation

Enter 【system configuration screen】 , the method to enter please see "log configuration".



1, use the [left and right button] to move the cursor to the 【purge data】 button.
2 use the [En] to clear data function.
3 pop up a confirmation dialog box.
Select [Yes], implement data- clearing.
Select [Cancel] or [No], give up clearing data.

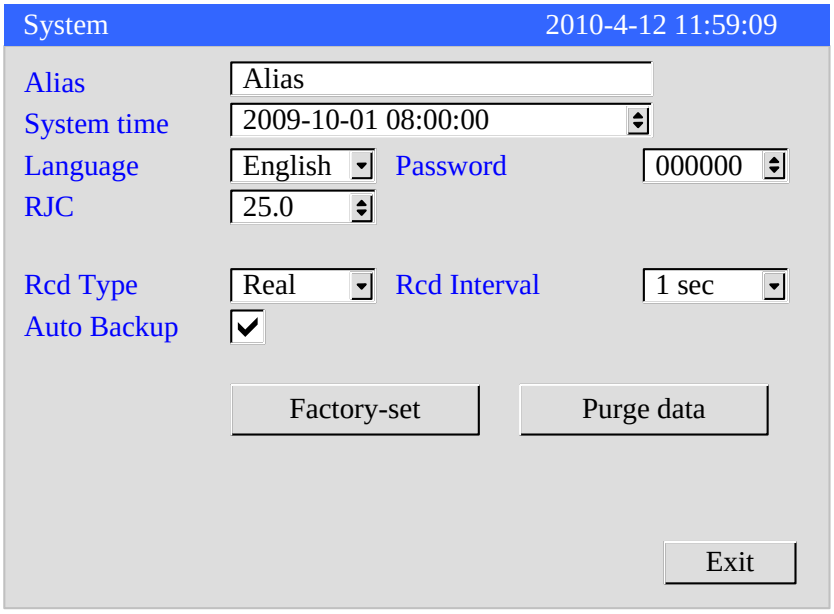
CHAPTER 6 SET RECORDS OF THE CONFIGURATION

6.1 SET THE RECORD INTERVAL

This section describes the settings of historical data records interval. Optional recording interval: 1 second, 2 seconds, 5 seconds, 10 seconds, 30 seconds, 1 minute, 2 minutes, 5 minutes, 10 minutes, 30 minutes.

Operation

Enter 【system configuration screen】 ,the method to enter please see "log configuration".



Record Interval: This field is used to set recorded interval

1, use the [left and right button] to move the cursor to the【interval】 column.
2, use the [up and down keys] to select record interval.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

NOTE

After modifying the record interval, the historical data which has been stored in the instrument is invalid.
The new valid data start from the time when user modifies it.
Before modifying the record in the interval, please back up the recorded historical data in the instrument.

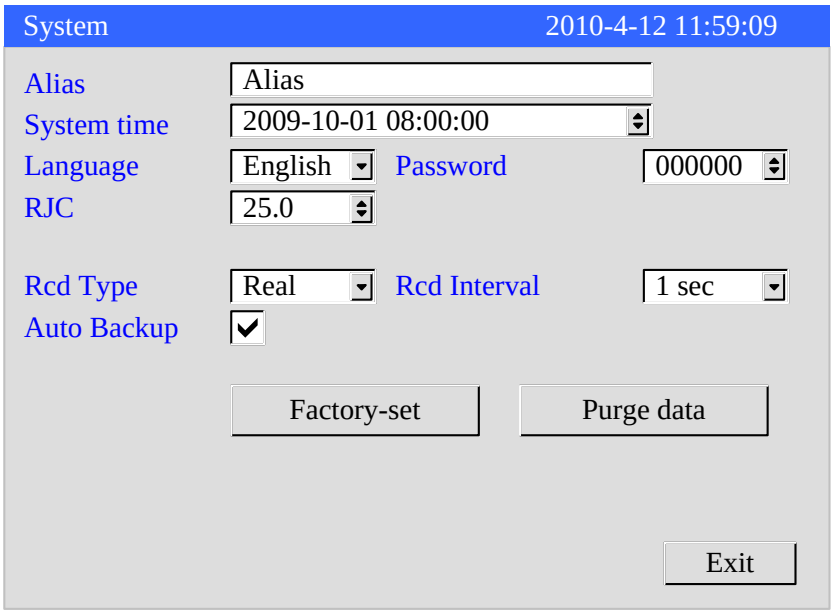
6.2 SET UP THE WAY OF RECORDING

This section describes setting and recording methods of historical data in the instrument.
When the recording interval is more than 1 second, depending on the recording method to select and calculate real-time value and record the calculated values.

Optional Recordings are: real-time values, average, maximum and minimum values.
Real-time value: Direct take the records of time corresponding to real-time value.
Average: take the average of real-time data before and after the recording points.
Maximum: Take the maximum real-time value before and after the recording data points
Minimum: Take the minimum real-time value before and after the recording data points

Operation:

Enter 【system configuration screen】 , the method to enter please see "log configuration".



Recording: This column is used to set recording method.

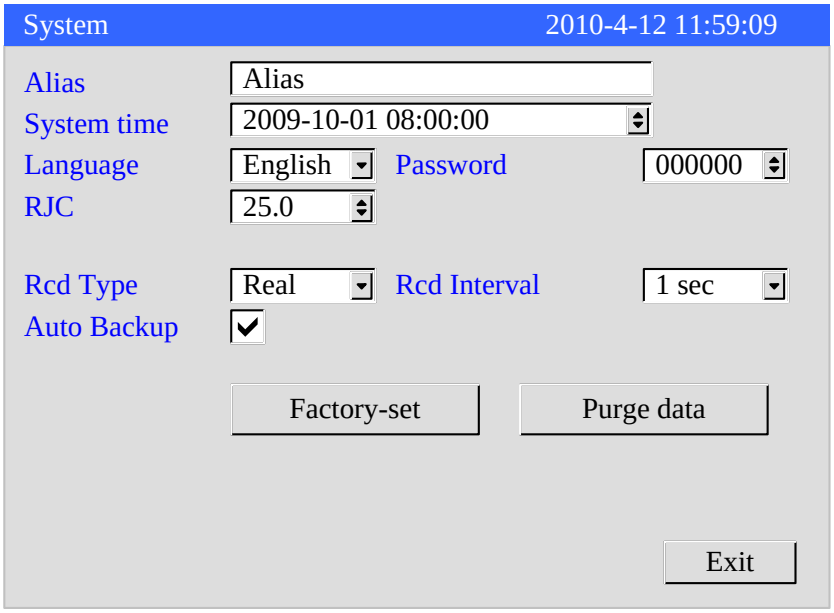
1, use the [left and right button] to move the cursor to the 【Record type】 column.
2, use the [up and down keys] to Select recording method.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

6.3 SET UP AUTOMATIC BACKUP

This section describes the principle and setting methods of historical data automatic backup.
Automatic backup time is 0: 0:0
The file is backed up in the directory of SD card's DATA\【device name】

Operation:

Enter 【system configuration screen】 ,the method to enter please see "log configuration".



Automatic backup: The bar sets up automatic backups.

1, use the [left and right button] to move the cursor to 【auto backup】 column.
2, use the [up and down keys] to open or turn off the automatic backup function.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

CHAPTER 7 SET THE INPUT CONFIGURATION

This chapter describes the channel type, signal type, the relationship between the signal range and range display, and the computing part of the channel involved

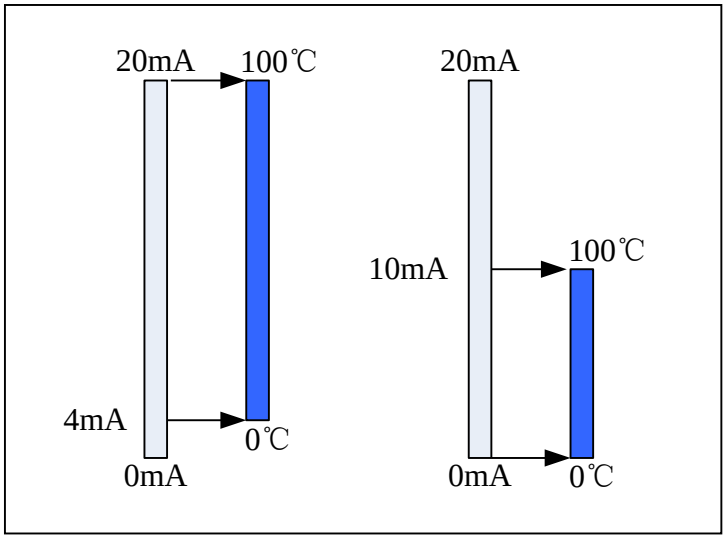
Channel types and signal types

Channel types	Signal types	Calculation type
Current	0-20mA，4-20mA，0-10mA	Linear operation
Voltage	0-5V，1-5V，0-10V，20mV，100mV	Linear operation
Resistance	400∩, 175∩	Linear operation
Frequency	Fr	Linear operation
RTD	PT100，PT100.，Cu50，Cu53，BA1，BA2	No
Thermocouple	S，R，B，K，N，E，J，T，WRE5-26，WRE3-25，F1，F2	No
Ordinary vacuum	4-20mA，0-5V，1-5V，0-10V	Normal vacuum operation
Sub-vacuum	4-20mA，0-5V，1-5V，0-10V	Sub-vacuum operation

Note: The thermal resistance and thermocouple signal range can not be changed; project quantity is the directly measured temperature.

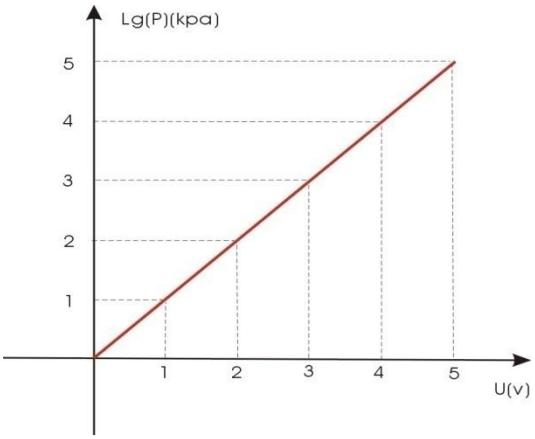
●Linear operation

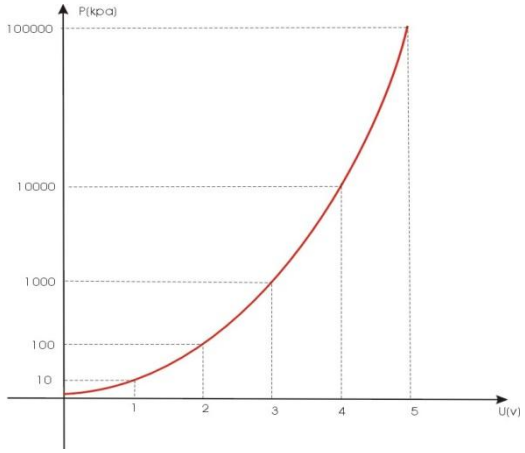
Semaphore transforms to project quantity according to the signal range and practical range of linear



●Ordinary vacuum operation

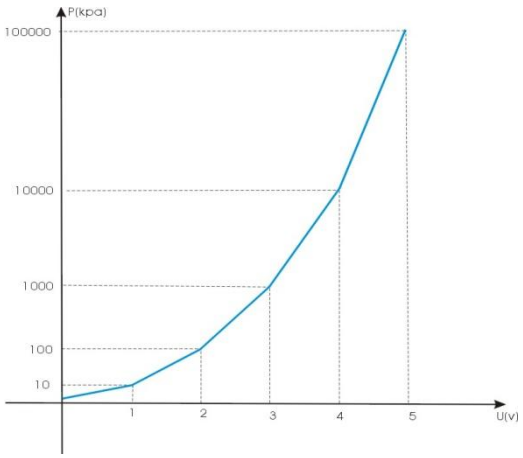
Semaphores and vacuum degree of logarithm has a linear relationship, signal range in the overall signal is free to set, the project range is expressed by 10 of the index form, ranging from 10E-9.999 to 10E9.999.

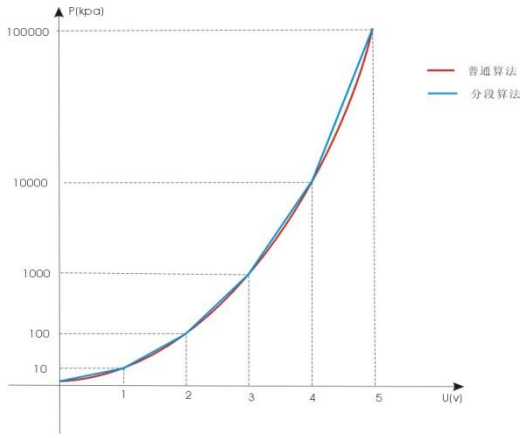




●Sub-vacuum operation

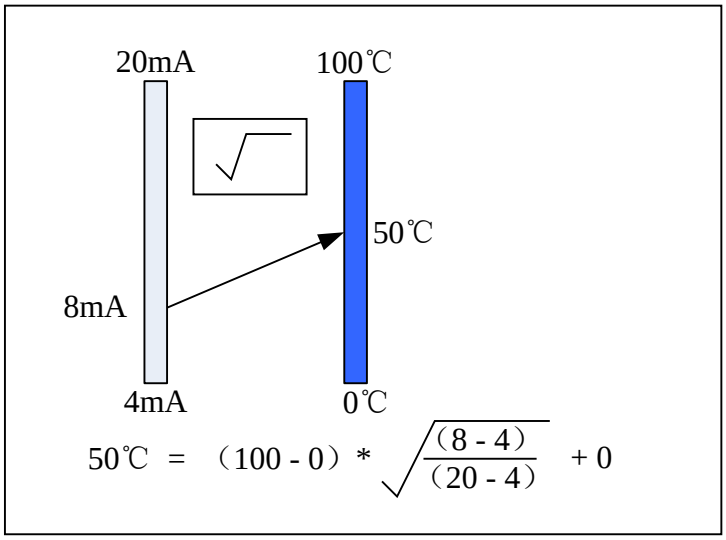
According to the vacuum degree of order , divide it into a number of sections , the corresponding signal of endpoint in every section and the vacuum degree has a linear relationship, at the same time, corresponding signal in the same section and the vacuum have a linear relationship too. Signal range in the overall signal is free to set; the project range is expressed by 10 of the index form, ranging from 10E-9.999 to 10E9.999.





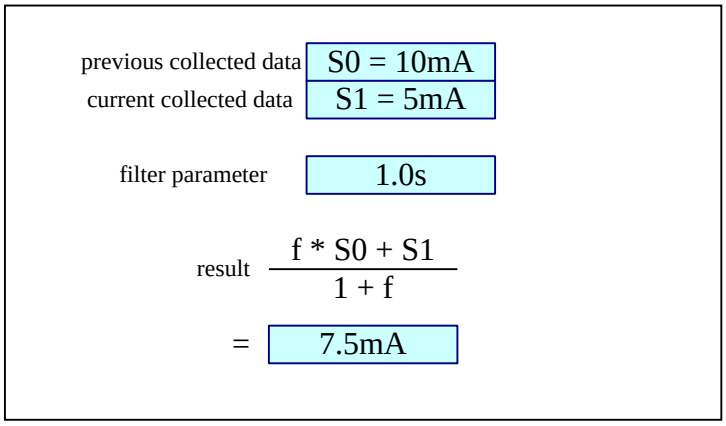
●Quare root calculation

The percentage of the measured signal values need to have a square root calculation



●Filtering operation

Filter parameters range from 0.0 seconds to 9.9 seconds .Take an example when the filter parameters is1.0 seconds



●Resection of the small-signal functions
less than the set value of the semaphore is zero, range: 0.0% ~ 9.9%.

●Line Regulation
Quantities according to the formula x = K * x + B linear adjustment.

●Burnout treatment,
The project quantity approach to deal with signal even break off, options are: maximum, minimum, to maintain the data, error markers, error markers. When choose error markers, collected data is the marked value.

●Reference Junction Compensation
Reference junction compensation for thermocouple

Channel types and the computation relationship

	Reference junction compensation	Removal of small-signal	Filter	Square root	Specific calculation	Adjust linear	Treatment of burnout
Current		●	●	●	Linear operation	●	●
Voltage		●	●	●	Linear operation	●	●
Resistance			●		Linear operation	●	●
Frequency		●	●		Linear operation	●	
Thermal Resistance			●			●	●
Thermocouple	●		●			●	●
Ordinary vacuum			●		General Vacuum		
Sub vacuum			●		Sub-vacuum		

●Tagging function is configurable function, and specific calculation can not be changed.
For current,burnout treatment is only used for 4-20mA signal,For voltage, it is only used for 1-5V signal.

Signal Type Measurement Range

Type	Range
0-20mA	-20mA ~ 20mA
4-20mA	4mA ~ 20mA
0-10mA	-10mA ~ 10mA
0-5V	-5V ~ 5V
1-5V	1V ~ 5V
0-10V	-10V ~ 10V
20mV	-20mV ~ 20mV
100mV	-100mV ~ 100mV
400Ω	0 ~ 400Ω
175Ω	0 ~ 175Ω
Fr	0 ~ 10KHz
PT100	-200℃ ~ 650℃
PT100.	--50℃ ~ 150℃
Cu50	-50℃ ~ 150℃
Cu53	-50℃ ~ 150℃
BA1	-200℃ ~ 650℃
BA2	-200℃ ~ 650℃
S	-50℃ ~ 1768℃
R	-50℃ ~ 1768℃
B	250℃ ~ 1817℃
K	-200℃ ~ 1372℃
N	-200℃ ~ 1300℃
E	-200℃ ~ 1000℃
J	-210℃ ~ 1200℃
T	-200℃ ~ 385℃
WRE5-26	0℃ ~ 2310℃
WRE3-25	0℃ ~ 2310℃
F1	700℃ ~ 2000℃
F2	700℃ ~ 2000℃

Note:

●Channel tag: 15 characters in length.

●Channel unit: Not involved in operations, only display, 7 characters in length, support mixed English and special characters.

●Channel decimal point: The calculation and display precision, 0 to 3 decimals.

●signal range: Within the entire range of signal, it is free to set signal acquisition range.

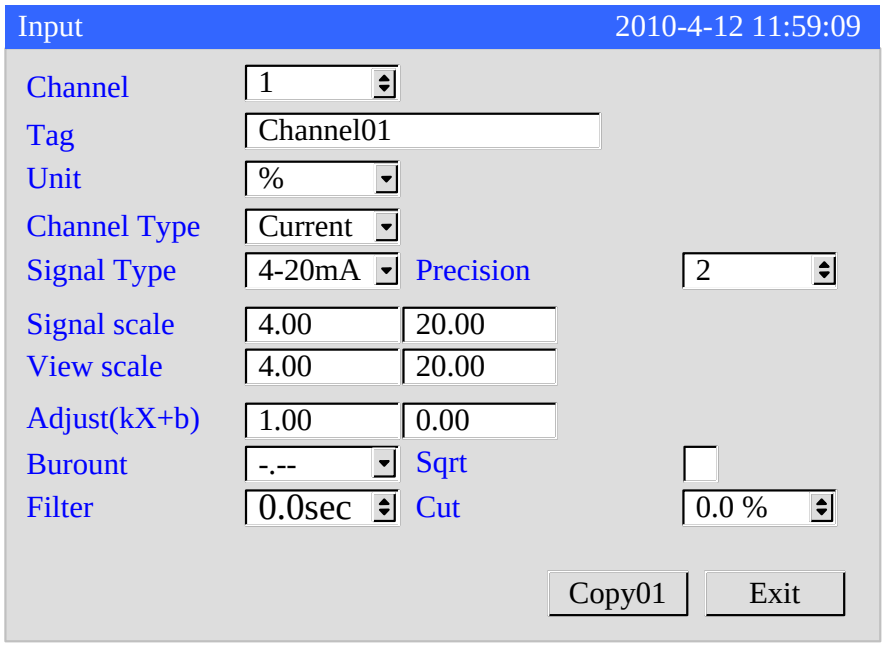
● Project Range: According to the project need, it is to be set free, -9999 ~ 30000, the decimal point 0 to 3.

7.1 SET INPUT TYPE AND SCALING

This section describes the channel type and range setting method.

Operation:

Enter 【Input configuration screen】 ,the method to enter please see "log configuration".



1, use the [left and right button] to move the cursor to the 【 channel type】, use the [up and down keys] to select channel type.

2, use the [left and right button] to move the cursor to the【signal type 】, use the [up and down keys] to select signal types.

3, use the [left and right button] to move the cursor to the 【precision】, use the [up and down keys] to adjust channel decimal point.

4, use the [left button] to move the cursor to the【 signal scale】, use the [En] to edit data, use the [up and down keys] to tune the data.

5, use the [left and right button] to move the cursor to the【display scale】, use the [En] to edit data, use the [up and down keys] to tune the data.

6, confirming operation

After the parameter setting, select [Exit] there is a Frame.

Select [Yes] to save setting content, and exit [System] screen.

Select [No] to cancel setting content, and exit [System] screen.

Select [Cancel] to continue setting parameters in [System] screen.

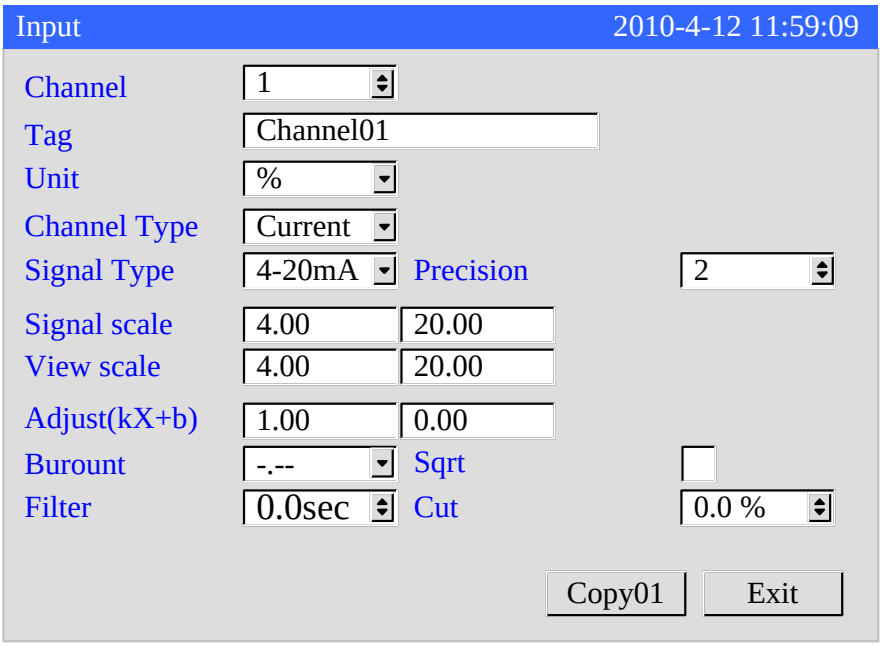
Note: The thermal resistance and thermocouple signal range cannot be changed.

7.2. SET CHANNEL TAG

This section describes how to set the channel tag.

Operation:

Enter 【Input configuration screen】,the method to enter please see "log configuration".



1, use the [left and right button] to move the cursor to the【tag 】
2 use the [En] to edit bit number.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

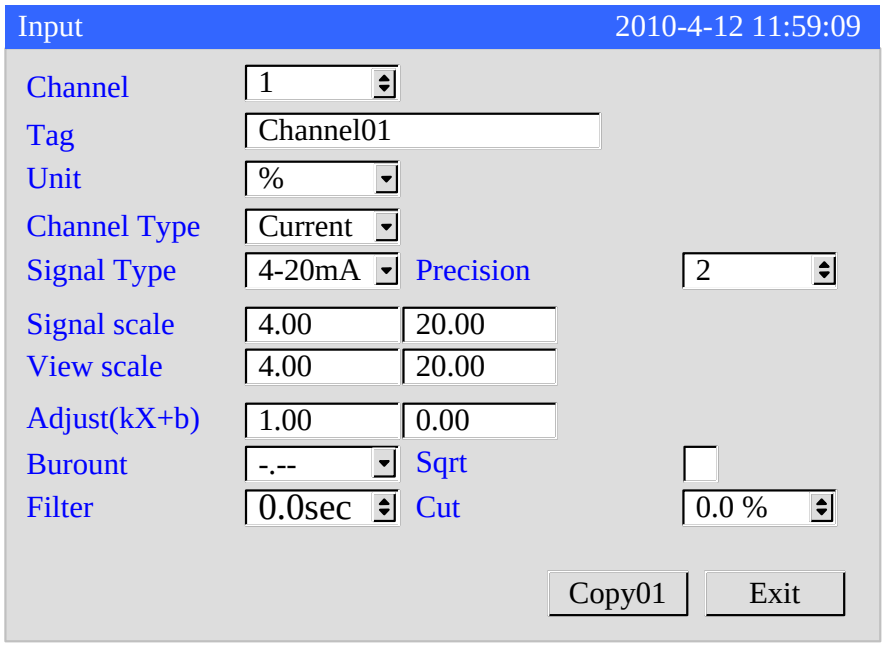
Note: The channel tag, 15 characters in length, mixed in English.

7.3 SET THE CHANNEL UNIT

This section describes how to set the channel engineering units.

Operation:

Enter 【Input configuration screen】 ,the method to enter please see "log configuration".



1,use the [left and right button] to move the cursor to the 【unit】.
2, use the [up and down keys] to select a common unit.
3 ,use the [En] to edit a custom unit.
4, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

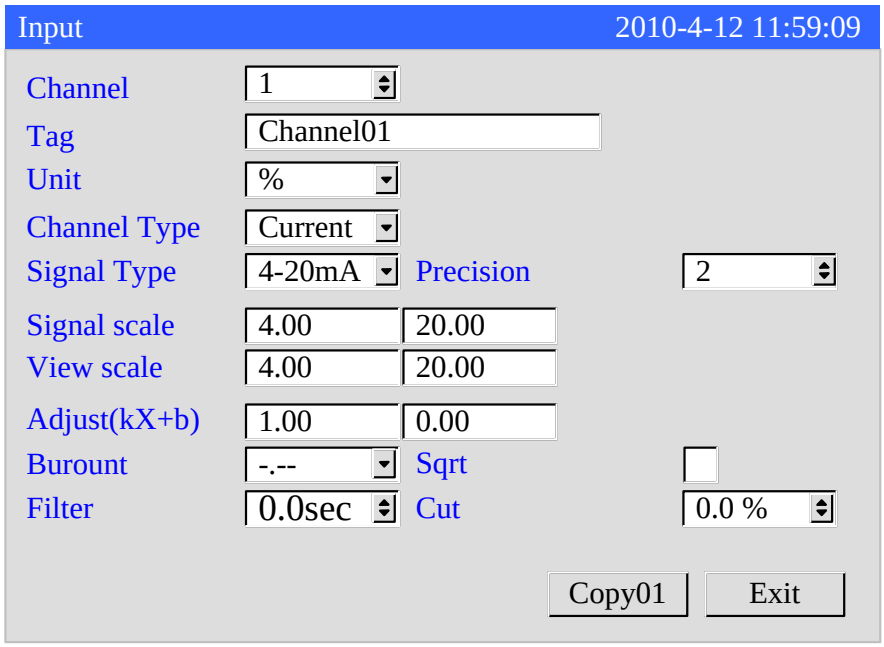
Note: The channel unit is not involved in operations, only display, 7 characters in length, supporting mixed English and special characters.

7.4 SET THE CHANNEL ADJUSTMENT

This section describes the channel linear adjustment.
Formula: project quantities= k ×Quantities + b.

Operation:

Enter 【Input configuration screen】 ,the method to enter please see "log configuration".



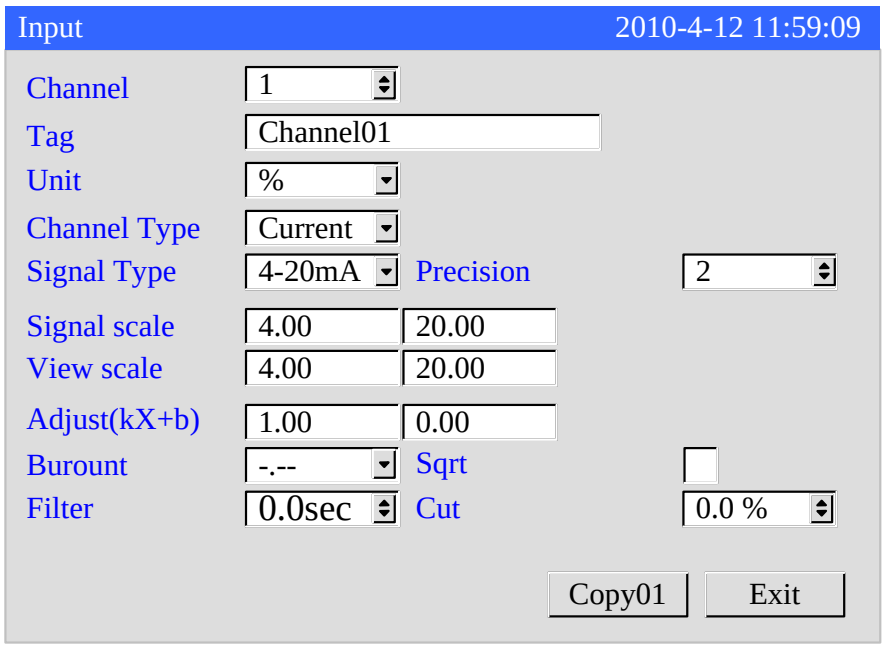
1. use the [left and right button] to move the cursor to the linear 【adjust(kX+b)】.
2, use the [up and down keys] to tune data; use the [En] to edit data.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

7.5 SET BURNOUT TREATMENT

This section describes how to deal with burnout. Burnout treatment is effective on the III type signal, thermal resistance and thermocouple signal.
Treatment methods: minimum, maximum, maintaining, -. -- (error flag). When you select an error flag, the data is -31098.

Operation:

Enter 【Input configuration screen】 ,the method to enter please see "log configuration".



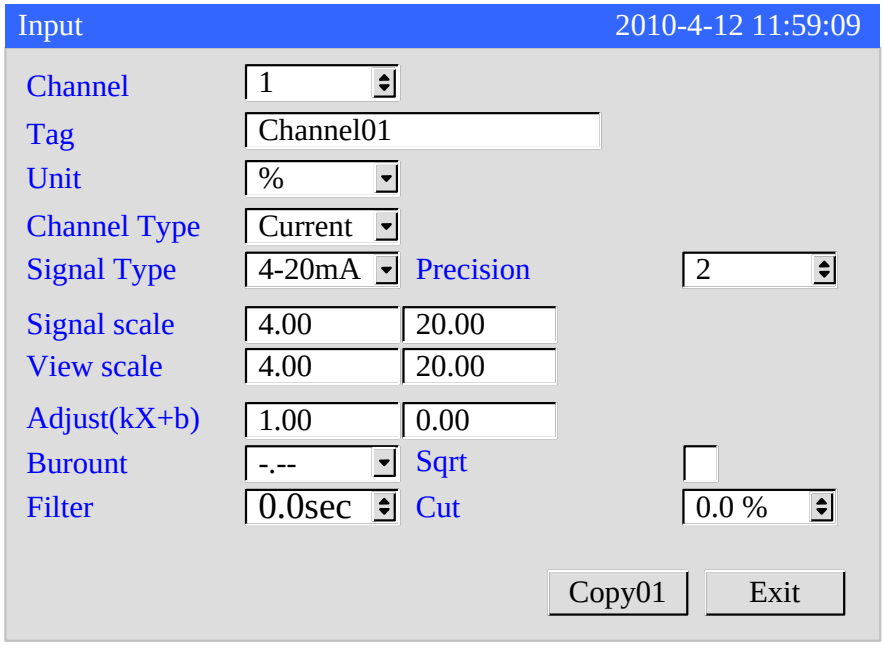
1, use the [left and right button] to move the cursor to the 【burnout 】
2, use the [up and down keys] to choose approach.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

7.6 SET SQUARE ROOT COMPUTATIONS

This section describes set the square root computations of channels. To operational principle please see 『set the channel type and range』 .

Operation:

Enter 【Input configuration screen】 ,the method to enter please see "log configuration".



1, use the [left and right button] to move the cursor to 【sqrt 】

2, use the [up and down keys] to open or close the square root computation functions.

3, confirming operation

After the parameter setting, select [Exit] there is a Frame.

Select [Yes] to save setting content, and exit [System] screen.

Select [No] to cancel setting content, and exit [System] screen.

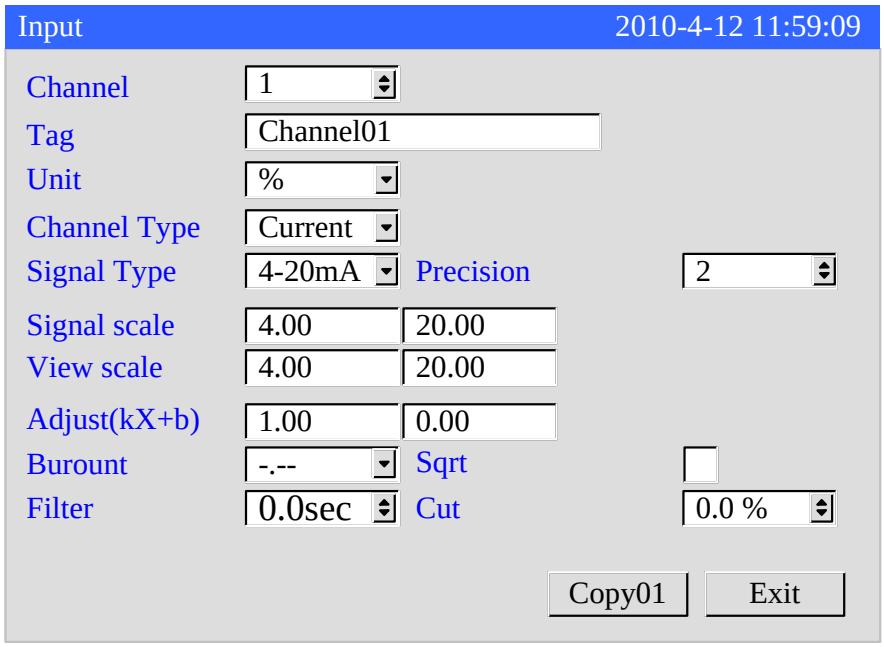
Select [Cancel] to continue setting parameters in [System] screen.

7.7 SET THE PARAMETERS OF CHANNEL FILTER

This section describes the channel filtering settings. Setting theory of filtering operation please see 『6.1』" channel types and range".

Operation:

Enter 【Input configuration screen】 ,the method to enter please see "log configuration".



1, use the [left and right button] to move the cursor to the 【filter】.

2, use the [up and down keys] to adjust the filter time parameter, ranging from 0.0 seconds ~ 9.9 seconds.

3, confirming operation

After the parameter setting, select [Exit] there is a Frame.

Select [Yes] to save setting content, and exit [System] screen.

Select [No] to cancel setting content, and exit [System] screen.

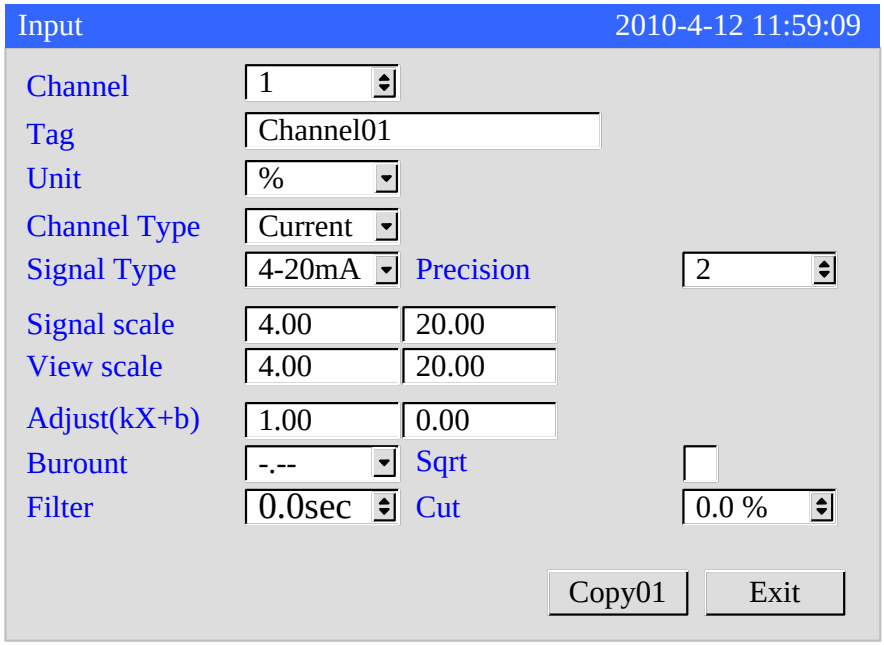
Select [Cancel] to continue setting parameters in [System] screen.

7.8 SET THE REMOVAL OF SMALL SIGNAL

This section describes the setting of channel small-signal removal function. Resection of the small-signal operation principles please refer to 『6.1』"set the channel type range".

Operation:

Enter 【Input configuration screen】 ,the method to enter please see "log configuration".



1, use the [left and right button] to move the cursor to the 【cut】.

2, use the [up and down keys] to adjust removal, general signal is 0.0% ~ 9.9%, the frequency signal is frequency value: 0 ~ 99Hz.

3, confirming operation

After the parameter setting, select [Exit] there is a Frame.

Select [Yes] to save setting content, and exit [System] screen.

Select [No] to cancel setting content, and exit [System] screen.

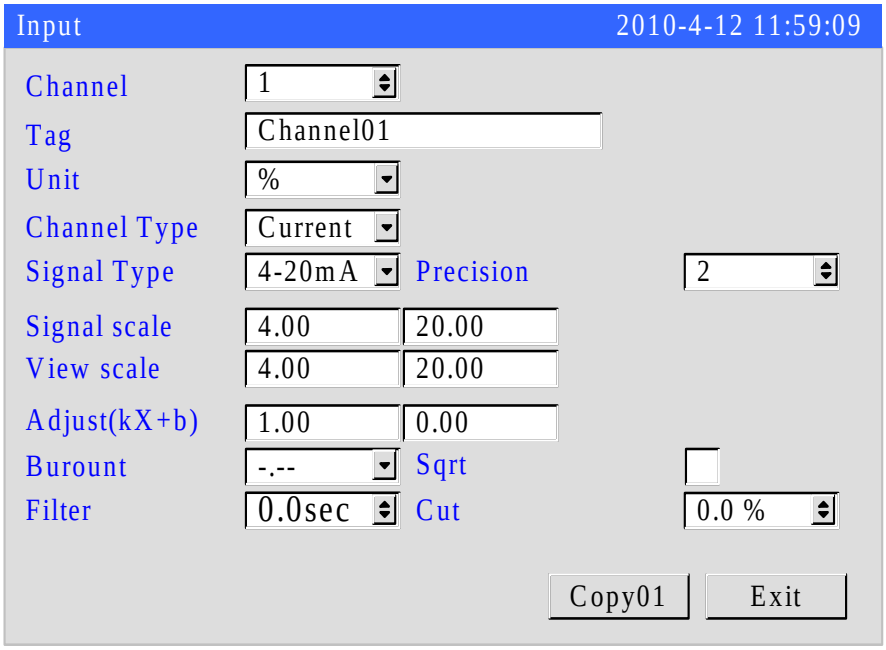
Select [Cancel] to continue setting parameters in [System] screen.

7.9 COPY CHANNEL CONFIGURATION

This section describes the channel configuration replication.

Operation:

Enter 【Input configuration screen】 ,the method to enter please see "log configuration".



1, use the [left and right button] to move the cursor to the 【channel】.

2, use the [up and down keys] to select the channel which needs configuration.

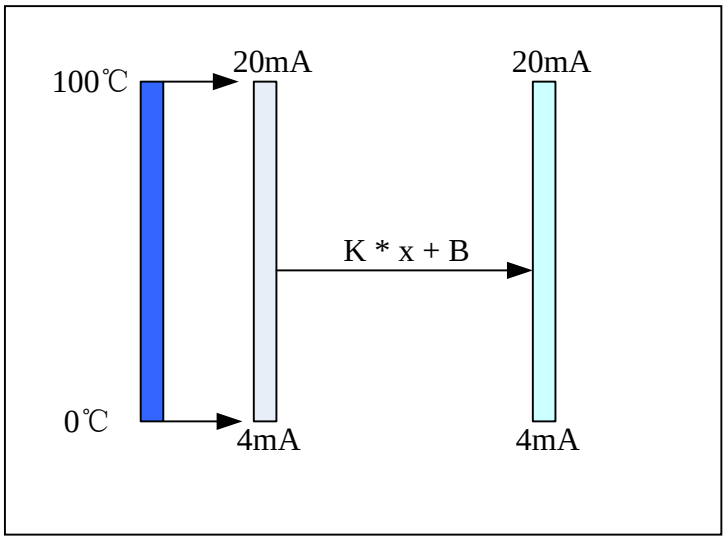
3, use the [left and right button] to move the cursor to the【copy xx】.

4, use the [up and down keys] to copy the source channel.

5 use the [En] to copy the source-channel configuration to the current channel configuration.

CHAPTER 8 SET OUTPUT CONFIGURATIONS

This chapter describes the principle and setting method of output transmission.
According to the source-channel project quantity and project range, to output a linear 4-20mA transmission,
Support the output kX + b adjustment, the source input channel can be set freely. Up to 4-channel can perform transmission output.

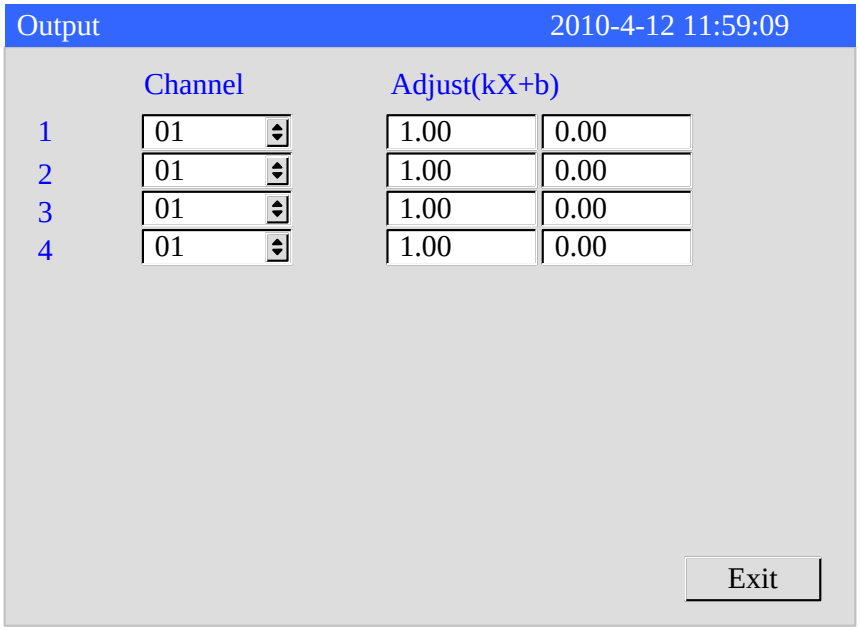


8.1 SET THE OUTPUT CHANNEL

This section describes the setting method of transmission output channel.

Operation:

Enter 【Input configuration screen】 ,the method to enter please see "log configuration".



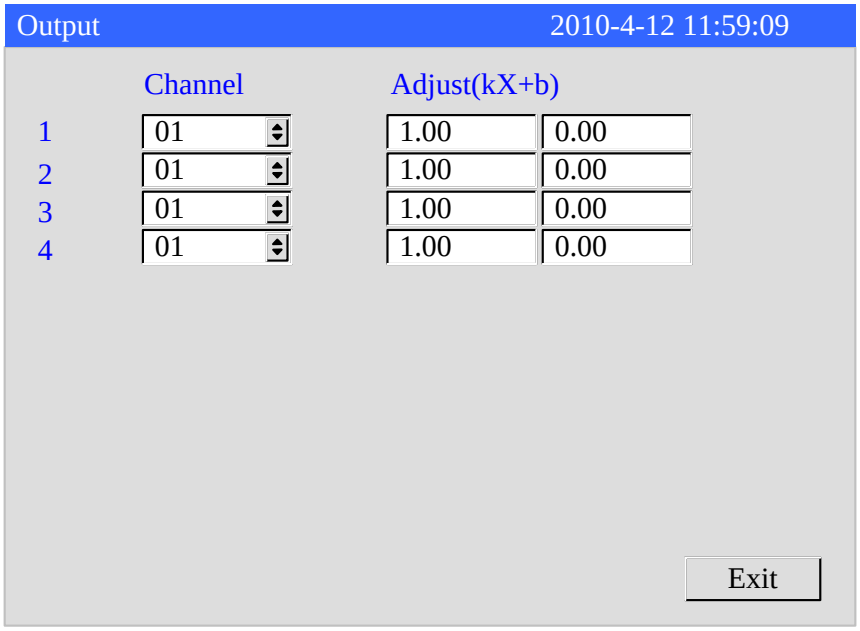
1, use the [left and right button] to move the cursor to the 【channel】.
2, use the [up and down keys] to select the output source channel or turn off the output.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

8.2 SET THE OUTPUT ADJUSTMENT

This section describes the setting methods of transmission output adjustment.
The formula:new output current = k ×original output current+ b.
e.g
If the original channel scale is 0 ~ 100℃, and the current scale is 25℃, adjust K=2.00 and b = 3.00, then
Before adjusting, output =(25 / (100 - 0) * (20 – 4) + 4) mA = 8mA
After adjusting, output= = K ×output + b = 2.00 * 8mA + 3.00 = 19mA

Operation:

Enter 【Input configuration screen】 ,the method to enter please see "log configuration".

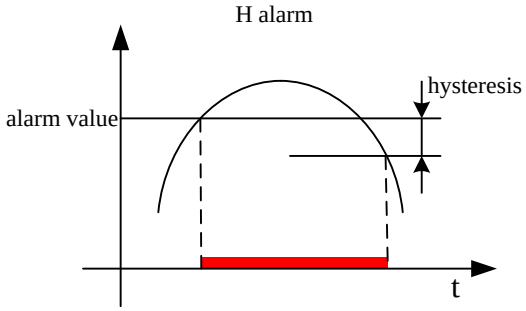


1, use the [left and right button] to move the cursor to the 【channel】.
2, use the [up and down keys] to tune data, and use [En] to edit data
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

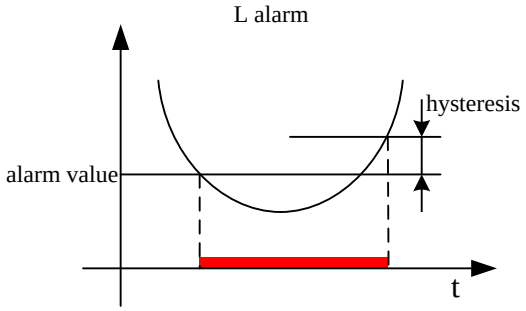
CHAPTER 9 SET ALARM CONFIGURATION

This chapter describes the alarm principle, relay contacts and set methods.
The amount of channel project within a certain range of values performs alarm and relay output. Optional alarm types are: H, L, I, D. 4-way alarm for each channel.

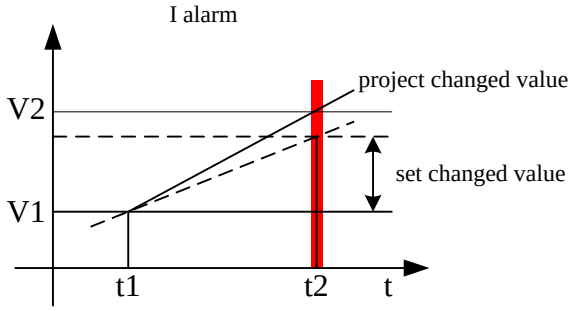
● H Alarm: When the project is greater than or equal to alarm value which has been set, alarm occurred. After alarm generated, the project is less than the amount or equal to (alarm value - hysteresis), then eliminate alarm.



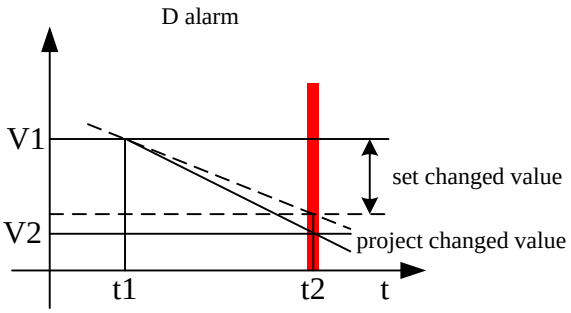
●L Alarm: When the project is less than the amount equal to the alarm value, the alarm occurred. After alarm generated, the project is greater than or equal to (alarm value + hysteresis), then eliminate alarm.



●I alarm: The project difference (V2 - V1) of a specific time interval point (t2 and t1) is greater than or equal to alarm value which has been set, alarm occurred.



●D Alarm: The project difference (V2 - V1) of a specific time interval point (t2 and t1) is greater than or equal to alarm value which has been set, alarm occurred.



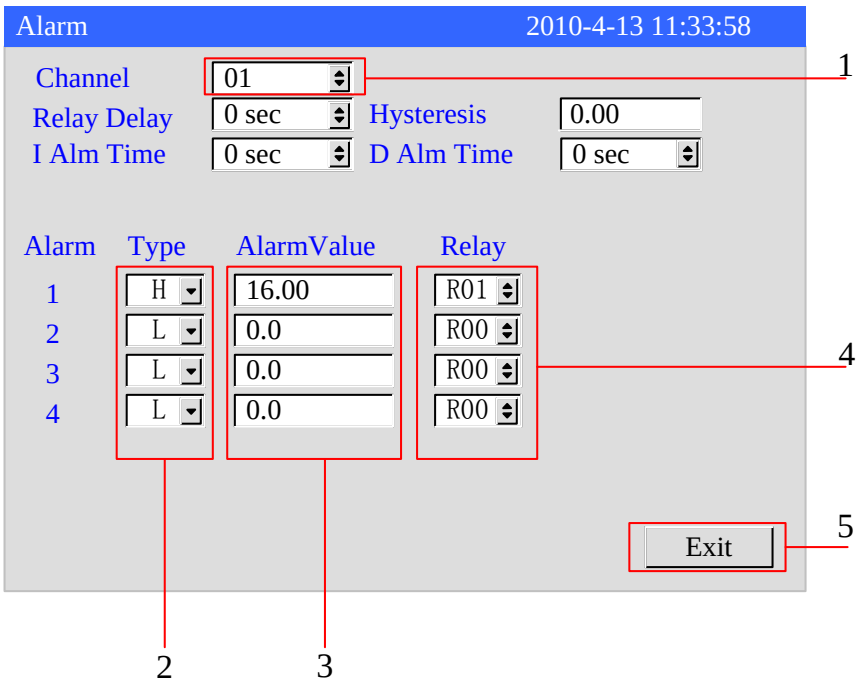
●Relay Delay: Relay delay time after the occurrence of an alarm, 0-10 seconds (optional). (Valid for all alarms)
●Hysteresis: hysteresis range of H/L‘s eliminating alarms (All channels is uniform)
● I Alarm Time: Alarm interval time of I. (All channels is uniform)
●D Alarm Time: Alarm interval time of D.ν (All channels is uniform)
●Relay Output: corresponding relay to alarm. Optional 1-12 or 1-8, when multiple alarms use the same one relay output, Use the stack output.
●Each alarm action and eliminating actions will have reported alarm information to form a warning list. The maximum of alarm list is 80.

9.1 SET THE ALARM AND RELAY CONTRACT

This section describes the setting methods of alarm parameters and relay contacts.

Operation:

Enter 【Alarm configuration screen】 ,the method to enter please see "log configuration".



1, use [left and right button] to move the cursor to the 【channel】,use the [up and down keys] to select channel configuration.

2, use the [left and right button] to move the cursor to the 【Type】, use the [up and down keys] to select alarm type and shut down alarm.

3, use the [left and right button] to move the cursor to the 【alarm value】, use the [up and down keys] tune data; use the [En] to edit data.

4, use the [left and right button] to move the cursor to the 【relay】,use the [up and down keys] to select relay contact number, R00 stands for closure; R1 ~ 12 stands for the corresponding relay output.

5, confirming operation

After the parameter setting, select [Exit] there is a Frame.

Select [Yes] to save setting content, and exit [System] screen.

Select [No] to cancel setting content, and exit [System] screen.

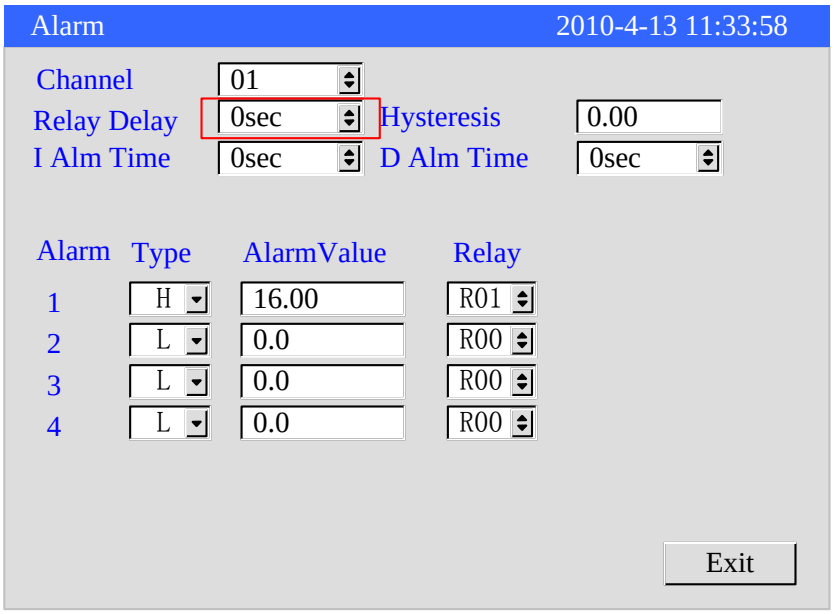
Select [Cancel] to continue setting parameters in [System] screen.

9.2 SET THE DELAY PERIOD OF RELAY OUTPUT

This section describes the time delay settings method of relay.

Operation:

Enter 【Alarm configuration screen】 ,the method to enter please see "log configuration".



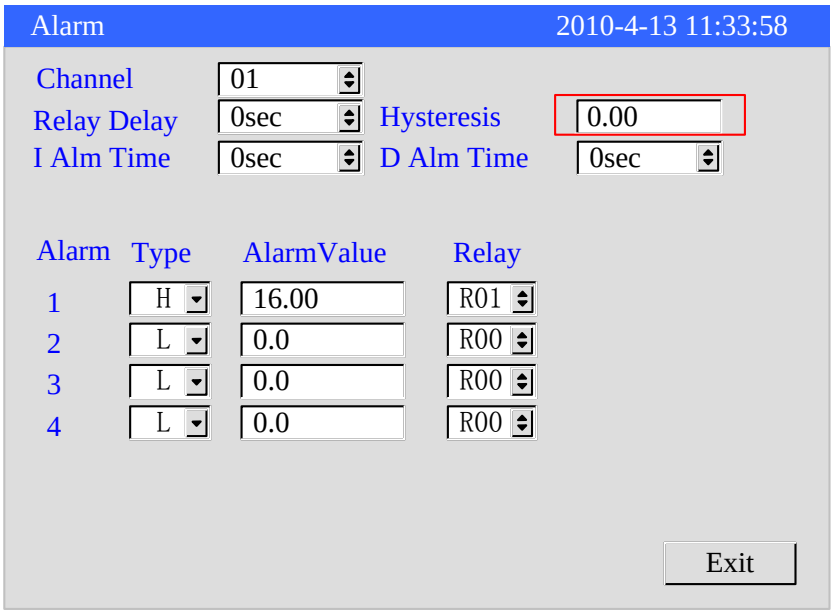
1, use [left and right button] to move the cursor to the 【relay delay】.
2, use the [up and down keys] to adjust the output delay time, ranging from 0 to 10 seconds.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

9.3 SET THE HYSTERESIS OF ALARM LIMIT

This section describes the setting method of hysteresis of alarm limit; hysteresis parameters are only valid for HL alarm.

Operation:

Enter 【Alarm configuration screen】,the method to enter please see "log configuration".



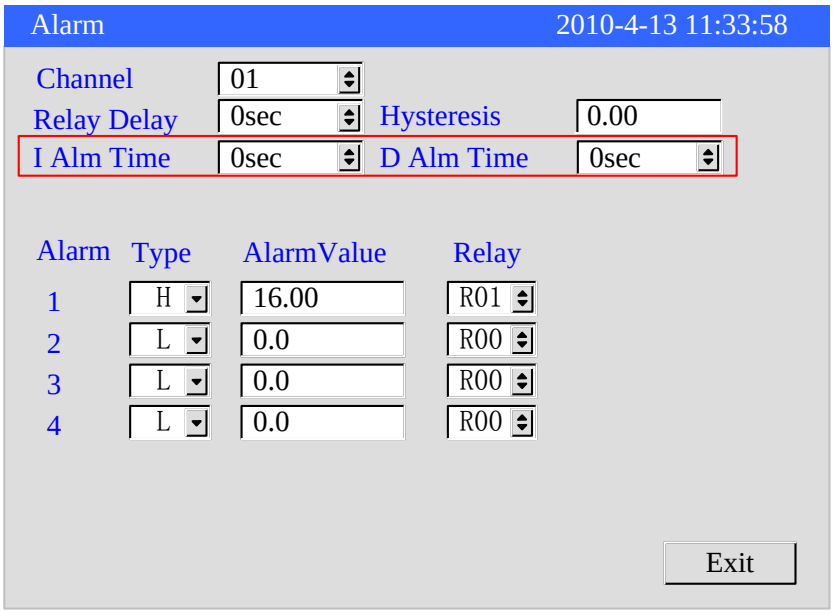
1, use the [left and right button] to move the cursor to the【hysteresis】.
2, use the [up and down keys] tune data; use the [En] to edit data.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

9.4 SET THE VARIATION OF ALARM TIME

This section describes setting method of the changes in the amount of alarm hysteresis. Incremental alarm periods is effective to I alarm, reduced alarm time is effective to D alarm.

Operation:

Enter 【Alarm configuration screen】,the method to enter please see "log configuration".



1, use the [left and right button] to move the cursor to the【I Alarm Time】, use the [up and down keys] to adjust the alarm time, the scope is 0 ~ 32 seconds.

2, use the [left and right button] to move the cursor to the 【reduced Alarm Time】, use the [up and down keys] to adjust the alarm time, the scope is 0 ~ 32 seconds.

3, confirming operation

After the parameter setting, select [Exit] there is a Frame.

Select [Yes] to save setting content, and exit [System] screen.

Select [No] to cancel setting content, and exit [System] screen.

Select [Cancel] to continue setting parameters in [System] screen.

CHAPTER 10 SET THE DISPLAY CONFIGURATION

This chapter describes the applications of channel combination.

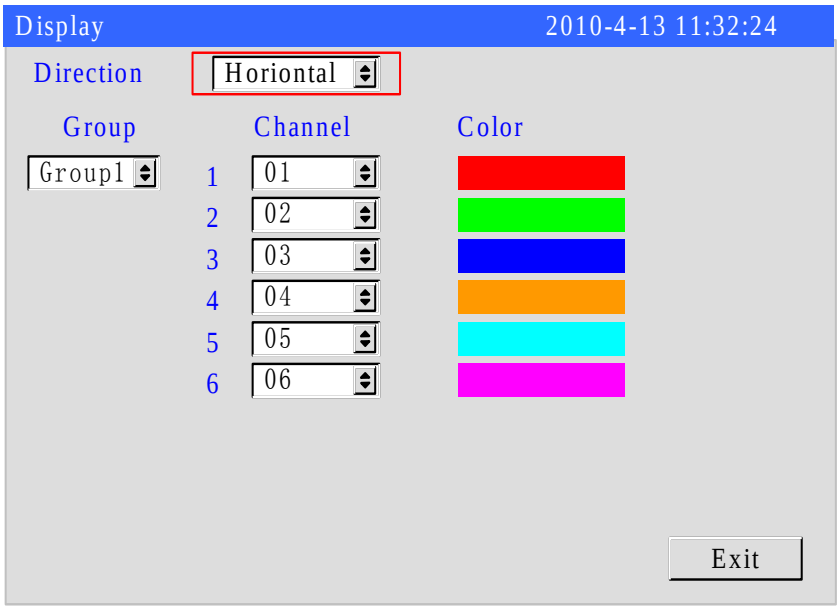
According to the channel combinations, Digital display screen, Bar graph screen, real-time curve screen and the historical curve screen have data or curves display; default settings without channel combinations, digital screen and bar diagram show in full-screen channel, real-time curve screen and the historical curve screen are in accordance with 4-way channel to display as a set of cycles. Details please refer to the screen description.

10.1 SET THE DIRECTION OF CURVES ON THE PAPER

This section describes the setting method of curve direction on the paper.

Operation:

Enter 【Display configuration screen】 ,the method to enter please see "log configuration".



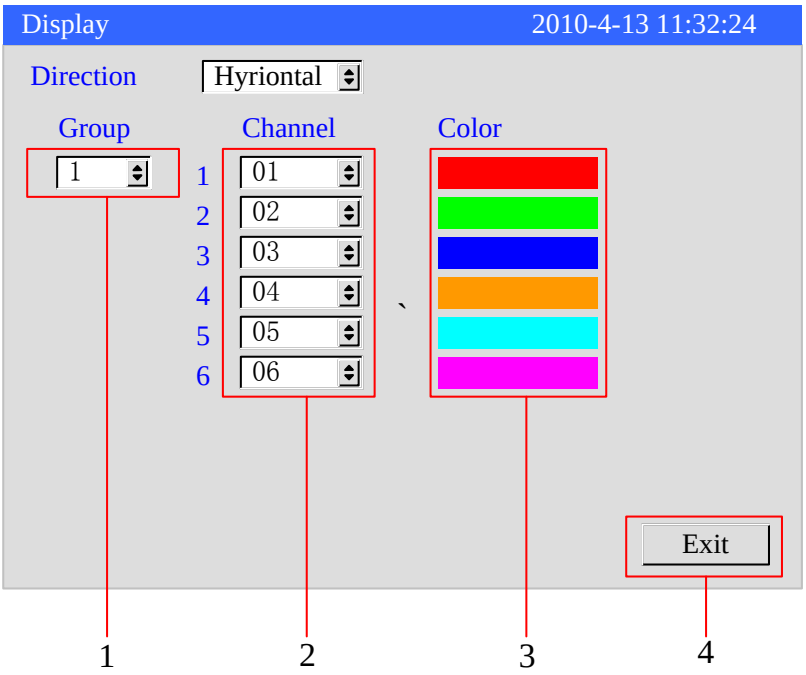
1, use the [left and right button] to move the cursor to the【 direction】.
2, use the [up and down keys] to choose the direction, horizontal or vertical (optional).
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

10.2 SET THE COMBINATION AND COLOR OF THE CHANNELS

This section describes the setting methods of combination of channels.

Operation:

Enter 【Display configuration screen】 ,the method to enter please see "log configuration".



1, use the [left and right button] to move the cursor to the 【group】, use the [up and down keys] to choose serial number.

2, use the [left button] to move the cursor to the 【channel】, use the [up and down keys] to select open or close channel.

3, use the [left and right button] to move the cursor to the 【Color】, optional colors: red, green, blue, yellow, blue, purple.Use the [up and down keys] to select channel color.

4, confirming operation

After the parameter setting, select [Exit] there is a Frame.

Select [Yes] to save setting content, and exit [System] screen.

Select [No] to cancel setting content, and exit [System] screen.

Select [Cancel] to continue setting parameters in [System] screen.

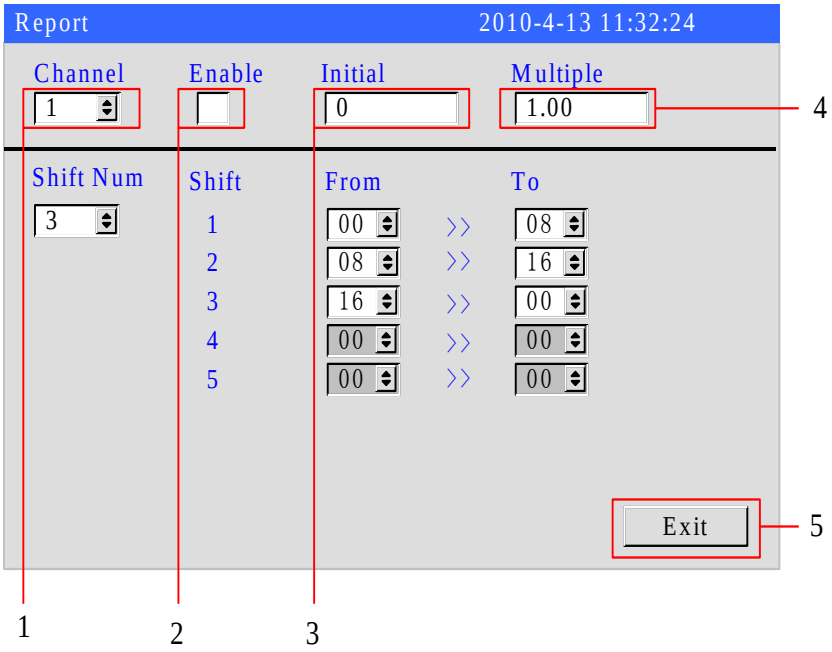
CHAPTER 11 SET THE REPORT CONFIGURATION

11.1 SET THE CHANNEL ACCUMULATION, THE INITIAL VALUE AND MAGNIFICATION

This section describes the setting method of cumulative channel, the cumulative initial value and cumulative magnification.
Cumulative Initial value: initial value of accumulation begins to accumulate.
Cumulative Rate: According to the normal rate of a cumulative accumulation to multiply.

Operation:

Enter 【report configuration screen】 ,the method to enter please see "log configuration".



1, use the [left and right button] to move the cursor to the 【channel】., use the [up and down keys] to select channel.

2, use the [left and right button] to move the cursor to the【 enable】, use the [up and down keys] to turn on or turn off the cumulative function.

3, use the [left and right button] to move the cursor to the 【initial 】, use the [up and down keys] tune data, use the [En] to edit data, ranging from 0 to 999999999.

4, use the [left and right button] to move the cursor to the【multiple】, use the [up and down keys] tune data, use the [En] to edit data, ranging from 0.00 ~ 100.00.

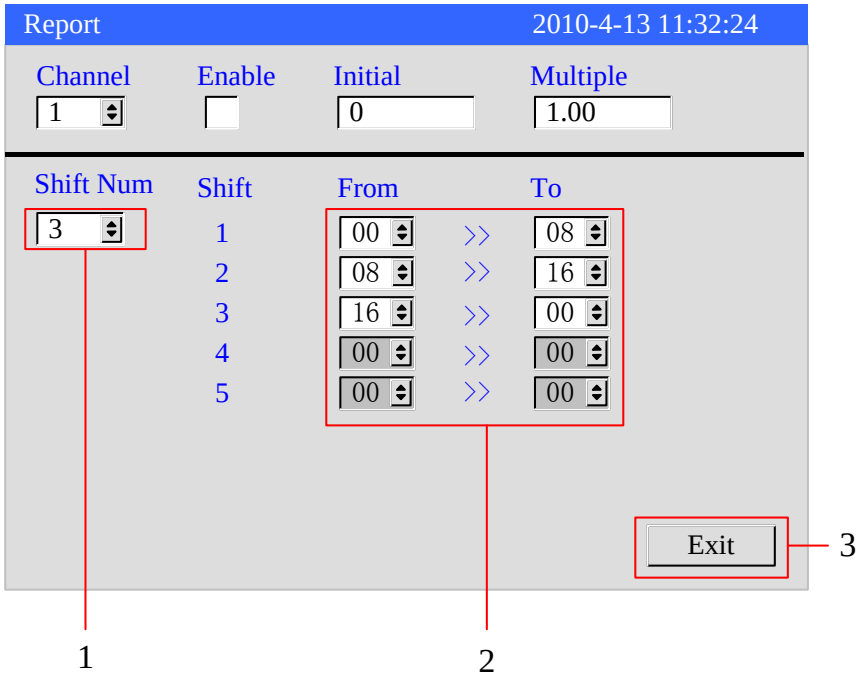
5, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

11.2 SET THE NUMBER OF THE SHIFT REPORTS AND TIME

This section describes the number of shift reports and time and setting methods.
The number of shift report: the number of classes per day
Shift: start time and end time of every class, 24-hour clock.

Operation:

Enter 【report configuration screen】 ,the method to enter please see "log configuration".



1, use the [left and right button] to move the cursor to 【shift number】, use the [up and down keys] to choose the number of shift reports, t five shifts are the larges.

2, use the [left and right button] to move the cursor to the【shift】, use the [up and down keys] to adjust the frequency of time.

3, confirming operation

After the parameter setting, select [Exit] there is a Frame.

Select [Yes] to save setting content, and exit [System] screen.

Select [No] to cancel setting content, and exit [System] screen.

Select [Cancel] to continue setting parameters in [System] screen.

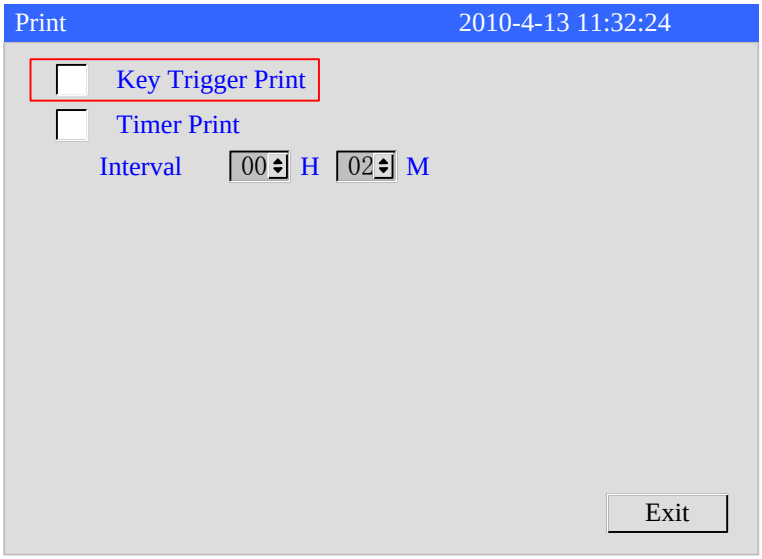
CHAPTER 12 SET PRINTING CONFIGURATION

12.1 SET KEY TRIGGER PRINT

This section describes the key trigger printing functions and settings methods.
Key trigger print: In the digital display screen, Bar graph screen, real-time curve screen, using the [Left] to trigger button printing, and then print the real-time data and cumulative amount.

Operation:

Enter 【print configuration screen】 ,the method to enter please see "log configuration".

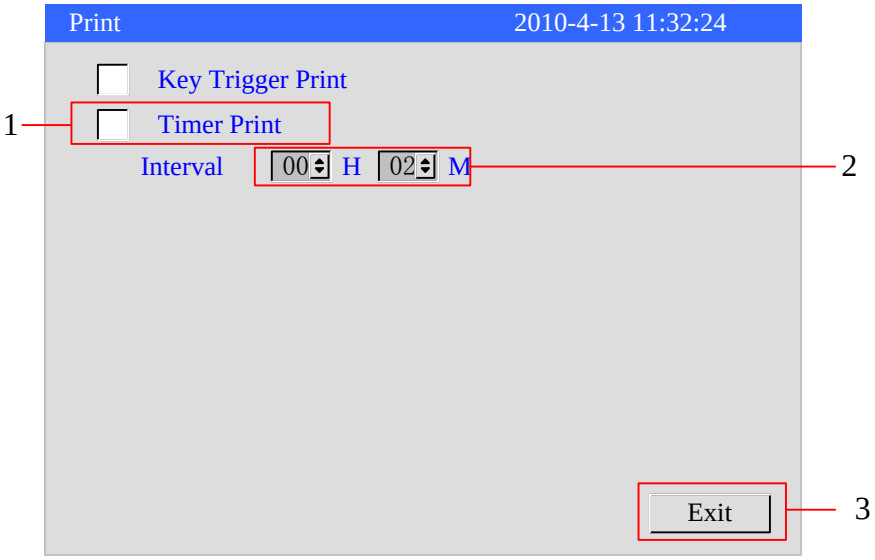


1, use the [left and right button] to move the cursor to the 【key trigger print】, use the [up and down keys] to open or close button printing functions.
2, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

12.2 SET TIMER PRINGTING AND THE TIME

This section describes the timer printing functions and settings methods.
Timer Print: each day, choose O: 00:00 as the starting time and print real-time data and accumulation according to time intervals.

Operation:
Enter 【print configuration screen】 ,the method to enter please see "log configuration".



1, use the [left and right button] to move the cursor to the 【timer Print】, use the [up and down keys] to close to open timing printing functions.
2, use the [left and right button] to move the cursor to the【interval】, use the [up and down keys] to adjust the print interval time in the format X/hour, X/minute.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

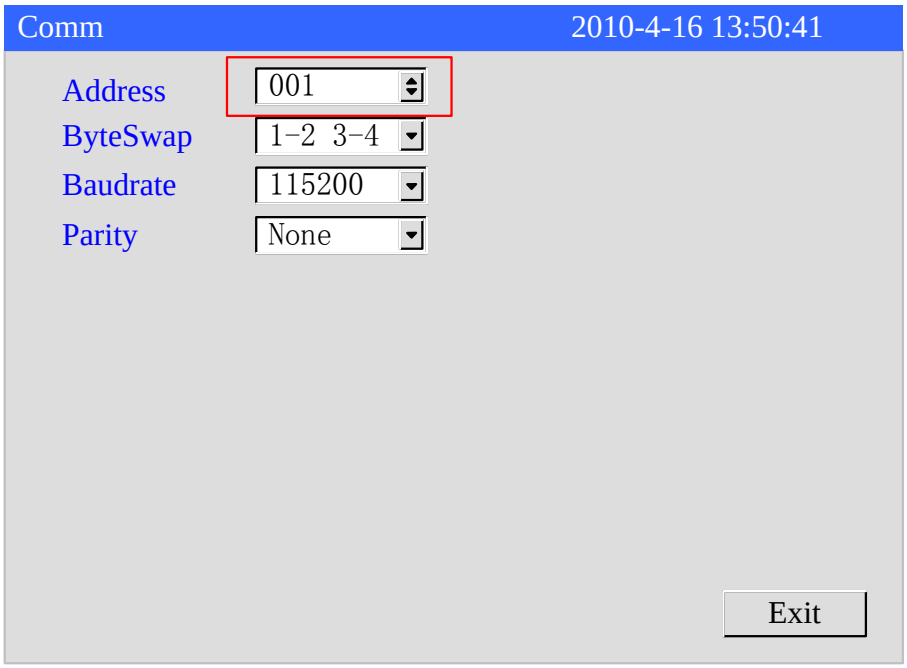
CHAPTER 13 SET COMMUNICATIONS CONFIGURATION

13.1 SET ADDRESS

This section describes the setting method of ModbusRTU mailing address.

Operation:

Enter 【communication configuration screen】 ,the method to enter please see "log configuration".



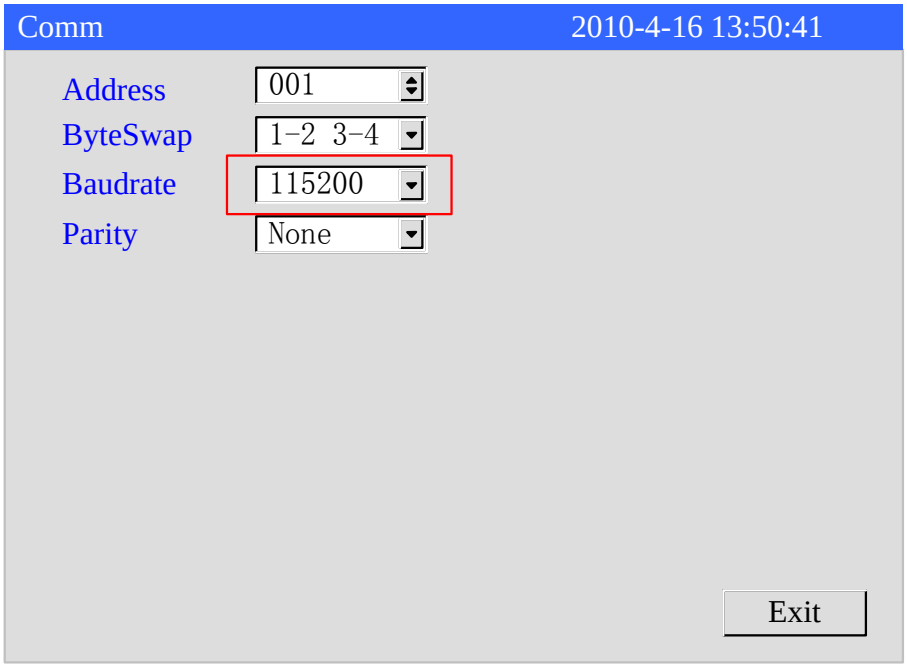
1, use the [left and right button] to move the cursor to the 【Address】.
2, use the [up and down keys] to modify the mailing address, ranging from 0 to 247.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

13.2 SET COMMUNICATION BAUD RATE

This section describes the setting method of serial communication baud rate.
Baud rate: 1200,2400,4800,9600,19200,38400,57600,115200. The default value is 115200.

Operation:

Enter 【communication configuration screen】 ,the method to enter please see "log configuration".



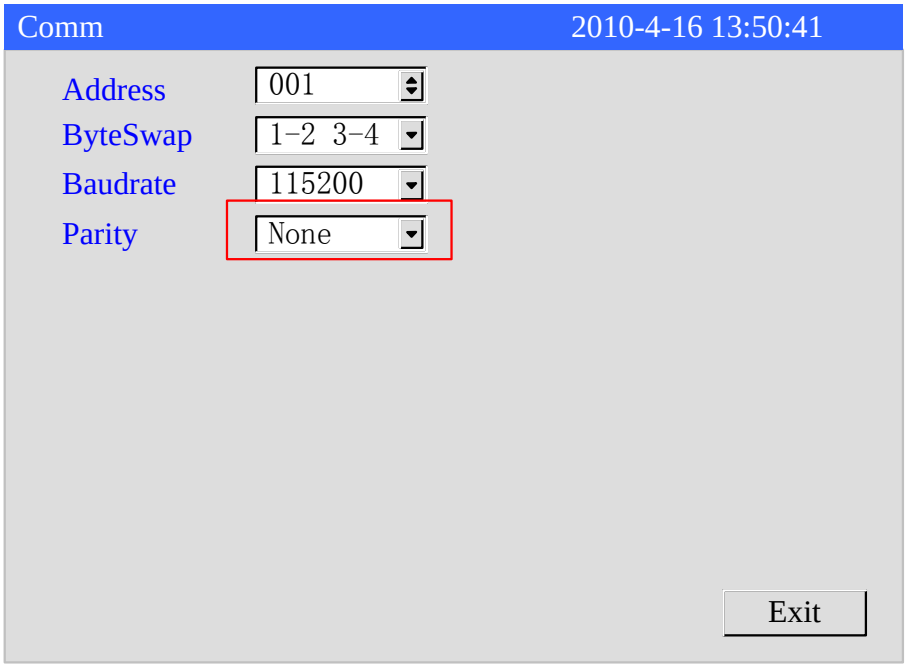
1, use the [left and right button] to move the cursor to the【 baud rate】.
2, use the [up and down keys] to select communication baud rate.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

13.3 SET COMMUNICATION CHECK

This section describes the setting method of serial communication check.
Parity: no parity, odd parity, even parity.
The default value is no check

Operation:

Enter 【communication configuration screen】 ,the method to enter please see "log configuration".



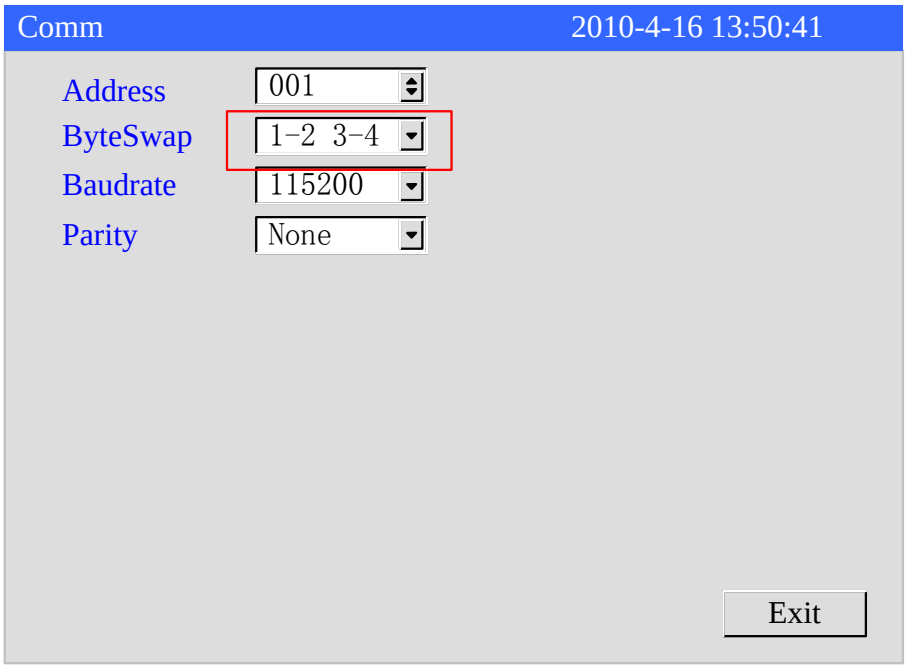
1, use the [left button] to move the cursor to the 【parity】.
2, use the [up and down keys] to Select check method.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen.

13.4 SET THE ORDER OF BYTE-SWAPPING

This section describes the setting method of ModbusRTU 32-bit data byte-swapping. In order to be suitable for ModbusRTU communication protocol, it provides byte-swapping functions.
Byte-swapping: 1-2, 3-4, 2-1 4-3, 3-4 1-2, 4-3 2-1. The default value is 2-14-3.

Operation:

Enter 【communication configuration screen】 ,the method to enter please see "log configuration".



1, use the [left and right button] to move the cursor to the 【byte swap】.
2, use the [up and down keys] to choose byte-swapping method.
3, confirming operation
After the parameter setting, select [Exit] there is a Frame.
Select [Yes] to save setting content, and exit [System] screen.
Select [No] to cancel setting content, and exit [System] screen.
Select [Cancel] to continue setting parameters in [System] screen

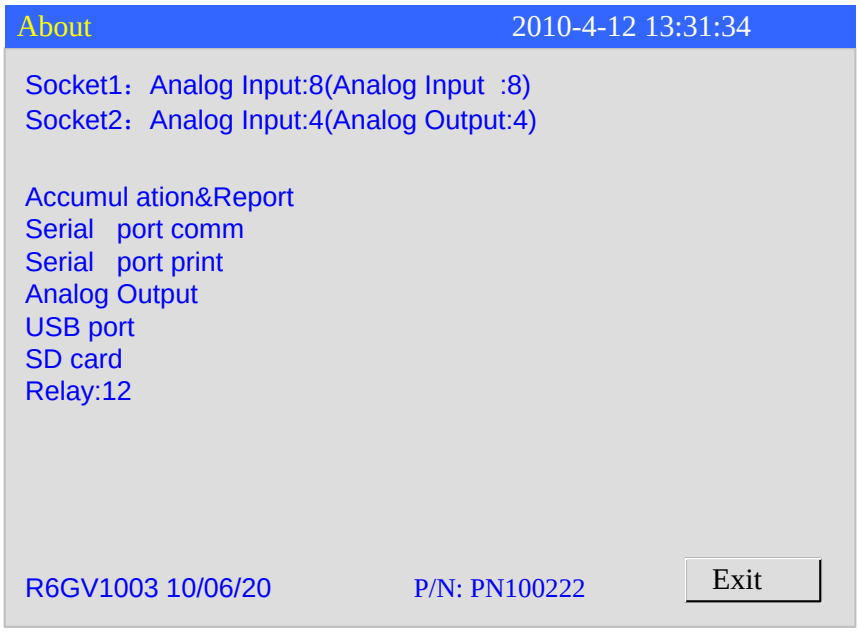
CHAPTER 14 CHECK SYSTEM INFORMATION

14.1 CHECK SYSTEM INFORMATION

This section describes how to check system information, and instrument setting.

Operation:

Enter 【system configuration screen】 ,the method to enter please see "log configuration".

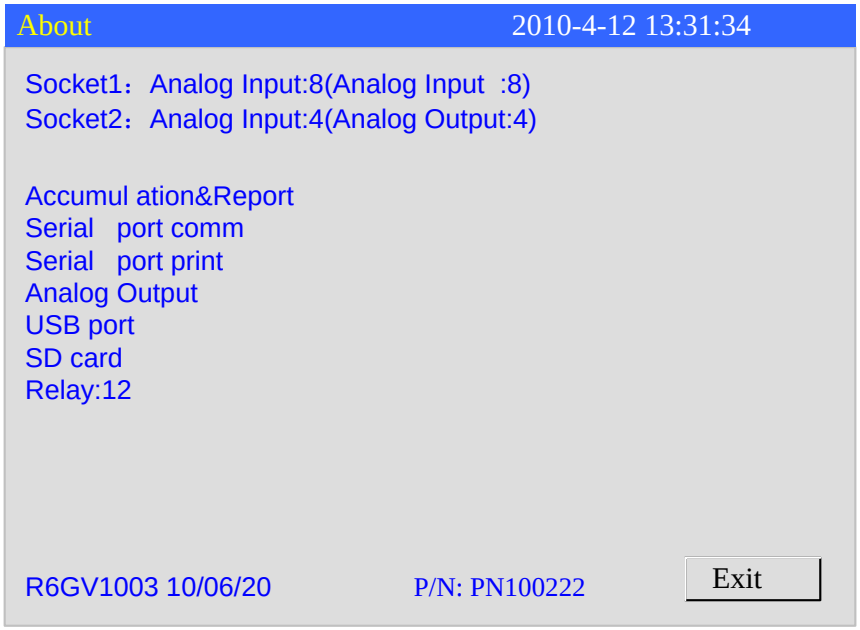


14.2 CHECK AD BOARD

This section describes the methods to check the status of AD board.

Operation:

Enter 【system configuration screen】 ,the method to enter please see "log configuration".



Blue Text (1: R7A8C: 8) is the inherent information in AD, black text (R7A8C: 8) is the current AD board information, if there is any difference between them, this shows that AD board failure, please contact the manufacturer for maintenance.

CHAPTER 15 SPECIFICATIONS

15.1 SIGNAL INPUT AND ALARM

Measurement input

Item	Specifications
The number of input channels	Simultaneously measuring up to 16 input channels
Measurement period	1 second
Signal type	DC current (I), DC voltage (V), thermocouple (TC), thermal resistance (RTC), frequency (FR)

Input measurement range and the measurable range

Type	Range	Measurable range
Current	4-20mA	4.00mA ～ 20.00mA
	0-20mA	-20.00mA ～ 20.00mA
	0-10mA	-10.00mA ～ 10.00mA
Voltage	1-5V	1.000V ～ 5.000V
	0-5V	-5.000V ～ 5.000V
	0-10V	-10.00V ～ 10.00V
	20mV	-20.00mV ～ 20.00mV
	100mV	-100.00mV ～ 100.00mV
Resistence	400Ω	0.0Ω ～ 400.0Ω
	175Ω	0.0Ω ～ 175.0Ω
Frequency	FR	0Hz ～ 10000Hz
RTD	PT100	-200.0℃ ～ 650.0℃
	PT100.	-50℃ ～ 150.0℃
	Cu50	-50.0℃ ～ 140.0℃
	Cu53	-50.0℃ ～ 150.0℃
	BA1	-100℃ ～ 600℃
	BA2	-100℃ ～ 600℃
Thermocouple	S	-100℃ ～ 1600℃
	R	-50℃ ～ 1600℃
	B	500℃ ～ 1800℃
	K	-50℃ ～ 1300℃
	N	-200℃ ～ 1300℃
	E	-100℃ ～ 1000℃
	J	-100℃ ～ 1000℃
	T	-100℃ ～ 380℃
	WRE5-26	0℃ ～ 2310℃
	WRE3-25	0℃ ～ 2315℃
	F1	600℃ ～ 2000℃

	F2	600℃ ～ 2000℃
	Measuring current: I = 0.5mA (resistance, heat resistance)	
Thermocouple burnout	Choose the maximum, minimum, error flag or keeping the former displayed value check current: About 2.5uA	

Item	**Specifications**
Thermocouple cold junction compensation	Using internal cold junction compensation, the compensation accuracy : ± 0.5 ℃
Digital filter	0 ~ 9.9 seconds inertia filter
Vacuum operation	
General algorithm	LOG curve is used in the whole range
Sub-algorithm	linear operation is used in every section

Alarm

Item	**Specifications**
The number of alarms	Each channel has 4 alarm
alarm type	High highalarm type , high alarm, I alarm , D alarm
Alarm delay time	0-10s
Alarm output	Alarm outputs to the internal relay Internal relay number: 8 Or 12(If the channel number is more than 12, it is 8, otherwise, it is 12) Internal relay operations: OR operation
Display	When alarm occurs, the corresponding screen displays the alarm status; the status display section displays the alarm icon.
Alarm information	Display alarm log in the alarm list

15.2 DISPLAY FUNCTION

Display

Item	Specifications
Display *	5.6-inch TFT color LCD display (320 × 240 points)
Display color	256 colors

Display Information

Item	Specifications
Display channel group	Channels will be allocated to real-time curve and historical curve show and then display
Group Number	6
The number of channels which an be allocated to each group	≤ 6
Display colors	256 kinds
Real-time curve display	
Renewal rate	1 record interval
Waveform width	1 pixel
Display method	Display perpendicular axes with timeline (T) and the measurement axis (Y) Layout: horizontal, vertical Div Curve cycle: recording interval × 30 div
Scale	To display each channel (0% ~ 100%)
Digital Display	Display measured values with digital
Update Rate	1 second
Bar graph display	Display measurement on the bar graph
Update Rate	1 second
Ruler	0% ～ 100%
Historical curves show	Display stored data in the memory
Timeline operation	Can enlarge one times / 2 times / 4 times / 8 times / 16 times / 32 times
Alarm list display	Display up to 80 alarm records

Other displayed information

Item	Specifications
Channel-bit	15 letters(numbers)
Channel units	7 letters (numbers)
Status display section Display content	Show the status of this instrument in the upper part of the display screen Searching status、 Display screen name, card status, alarm status, SD card status, USB device status, circular display status, year, month, day, hour, minute, seconds
Automatic switch of Show group	At the specified time interval to switch display groups Time interval: 5 seconds
Language	English
System information display	Show the number of input and output card channels, relay output channels, instrument additional features, firmware version, production date and released date

15.3 DATA STORAGE FUNCTION

Setting

Item	Specifications
External storage media	Back up the record data in the device
Media	U Disk, SD card
Capacity	up to 4GB(U disk), 2 GB (SD card)
File format	FAT32
File Name	DAT+ "number" (can edit)
Report Name	REP+ "number"(can edit)

Data type

Item	Specifications
Data Size	
Sampled data	2 bytes/ data values
Cumulative amount	8 bytes/ data values
Data Format	Binary Data
The sampling period	Equal to recording interval
Recording method	Always recording

15.4 OTHER STANDARD FEATURES

Time-related functions

Item	Specifications
Clock	Can operate in 2000 ~ 2099
Clock Accuracy	± 10ppm (0 ~ 50 ℃), does not include the delay caused by the error when the power is on(less than 1 second)
Life of Clock battery	About 10 years (under room temperature)

The type of characters which can be inputted

Item	Specifications
Characters	In English (uppercase, lowercase), numbers, and symbols (within limitations)

15.5 CHOOSE ACCESSORIES

Alarm output relay

Item	Specifications
Action	Output relay contacts signal from the back panel of the terminal when alarm occurs
Output points	Up to 8points, if channel number is more than 12; otherwise, it is up to 12 points
Relay electric shock rating	250VAC(50/60Hz)/3A，250VDC/3A((load resistance))
Output Type	Normal open
Relay Operation	OR operation

RS232C/RS485

Item	Specifications
Physic level	RS-232、RS485(option)
Protocol	MODBUS-RTU
Communication rate	1200/2400/4800/9600/19200/38400/57600 bps
Byteswap	2-1 4-3、1-2 3-4、4-3 2-1、3-4 1-2
Data length	8bits
Stop bit	1bit
Parity bit	1bit
Parity	None/ odd/ even parity

24VDCPower Distribution

Item	Specifications
Loop	4
Output voltage	22VDC ～ 25VDC（rated output current）
Maximum output current	65mADC(overload protection current: approximately 90mADC)
Allowed impedance	≤ 750Ω

USB Function

Item	Specifications
USB port	Compatible with USB2.0 protocol
Number of ports	1
Capacity	Maximum: 4 GB
Power Supply	5V ±10%，100mA
Devices can be connected	U disk

SD card function

Item	Specifications
SD card port	Compatible with SD protocol(NOT SDHC)
Number of ports	1
Capacity	Maximum: 4 GB
Devices can be connected	SD card

Analog signal output

Item	Specifications
Output Type	4-20mA
Number of output channels	up to 4
Allowed impedance	≤ 750Ω

15.6 GENERAL SPECIFICATIONS

Frame

Item	Specifications
Installation	Embedded instrument panel installation (vertical plane)
Angle	Allow for a maximum of 30 degrees after the tilt from horizontal
Plate thickness of installation	1 ～ 10mm
Material	Panels and Terminal Material: ABS plastic Shell: Aluminum alloy
External dimensions	144(W)×144(H)×220(D)(D：the length from the installation panel to terminal)
Weight	About2.6Kg(not including accessories)

Standard operating conditions

Item	Specifications
Supply power Voltage	220VAC
Power Frequency	50Hz
Ambient temperature	0℃ ～ 50℃
Environment Humidity	20% ～ 85%RH(non-condensing)
Warm-up Time	30 minutes after power is switched on
Installation location	Indoor

Power

Item	Specifications
Rated supply voltage	220VAC
Allowed voltage range	85VAC ～ 220VAC
Rated power frequency	47-63Hz
Power consumption	≤20W(including the matching function)

Transportation and storage condition

Item	Specifications
Temperature	-10℃ ～ 60℃
Humidity	0% ～ 95%(non-condensing)
Shake-proof	10～55Hz，10m/S^2，2 hours
Impact-proof	Working:30/S^2(3g)，Transporting:100g

Insulation

Item	Specifications
Resistance voltage	Measurement input terminals:： 400V between protective ground and measured terminal: 1000V
Grounding resistance	Grounding resistance ≤ 10Ω

Transportation and storage conditions

Item	Specifications
Ambient temperature	-10℃ ～ 60℃
Environment Humidity	0% ～ 95%(non-condensing)

Electrical characteristic

Signal type	Range	Precision（25℃）	Input impedance
4-20mA	4.00-20.00	±0.2%	249
0-20mA	0.00-20.00	±0.2%	249
0-10mA	0.00-10.00	±0.2%	249
0-5V	0.000-5.000	±0.2%	1M
1-5V	1.000-5.000	±0.2%	1M
0-10V	0.000-10.000	±0.2%	1M
0-20mV	0.00-20.00	±0.2%	10M
0-100mV	0.00-100.00	±0.2%	10M
400ohm	0.0-400.0	±0.2%	---
175ohm	0.0-175.0	±0.2%	---
Fr	0-10000	±1Hz	---
S	-50-1768	±2℃	10M
R	-50-1768	±2℃	10M
B	250-1820	±2℃	10M
K	-200-1372	±1℃	10M
N	-200-1300	±1℃	10M
E	-200-1000	±1℃	10M
J	210-1200	±1℃	10M
T	-200-400	±1℃	10M
WRE5-26	0-2310	±2℃	10M
WRE3-25	0-2310	±2℃	10M
F1	700-2000	±2℃	10M
F2	700-2000	±2℃	10M
Pt100	-200.0-650.0	±0.4℃	---
Pt100.	-50.0-150.0	±0.2℃	---
Cu50	-50.0-150.0	±0.4℃	---
Cu53	-50.0-150.0	±0.4℃	---
BA1	-200.0-650.0	±0.4℃	---
BA2	-200.0-650.0	±0.4℃	---

Frenquency input board

Item	Specification
Channel number	8 channel/ per board
Low level	Minimum:-5V，Maximun2V
High level	Minimum:4V，Maximun26V
Duty ratio	10%-90%
Drive current	Minimum:1.5mA

Anolog output board

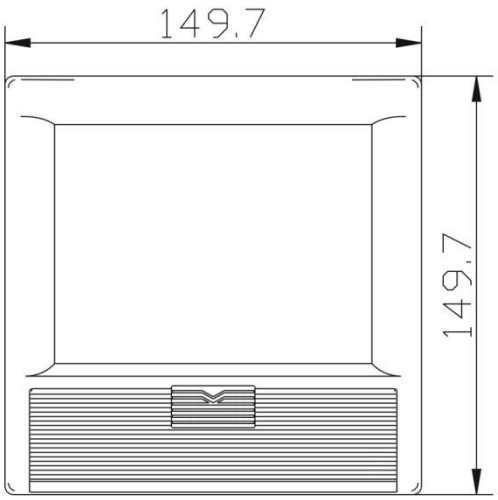
Item	Specification
Output signal	4－20mA
Resolution ratio	12 bit
Load	750ohm
Precison	0.2%F.S
Response time	1second
Temperature drift coefficient	1uA/℃

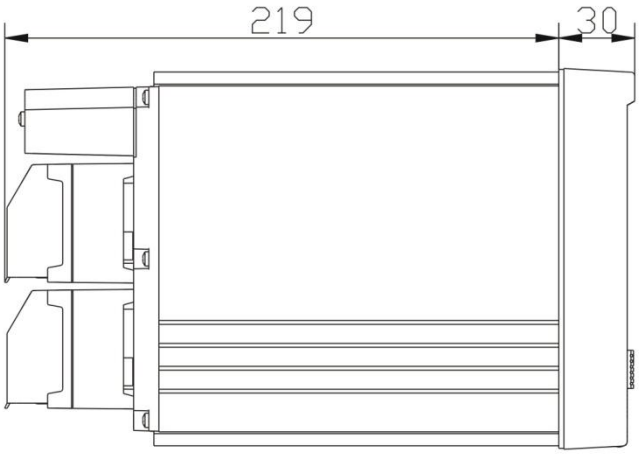
Other standard

Item	Specification
Data storage limit	About 10 year
Safty agency approval	EN61010-1:2001
Electromagnetic compatibility	EN61326-1:2006 EN61000-3-2:2006 EN61000-3-3:2008
Protection grade	Front panel IP50，complete machine:IP40

15.7 EXTERNAL DIMENSIONS

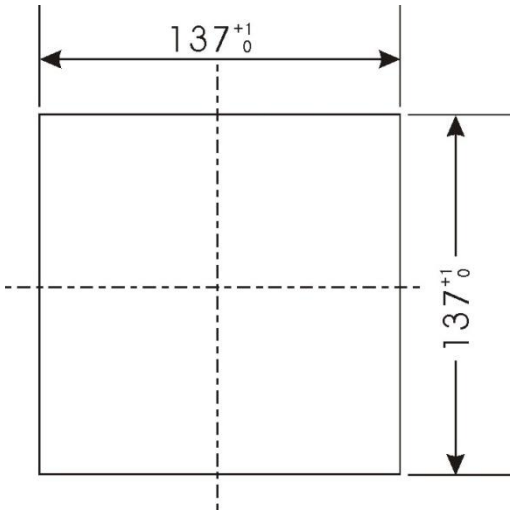
Unit: mm





Dimensions of Instrument installation

Hole size of Instrument



Hole size of container: